NEWBURY

The home of Low Cast

Visual Display Ternunals

Newbury Lahoreteries Ltrl.

King Street, Odiham

Tel 025-671 2910

Hampehire RG25 1NN

PRICES

. FROM £535

NEWS IN BRIEF

French plans bogged down

WHILE British plans to support its microelectronics industry are rapidly coming to fruition. French government plans have become bogged down. Only one part, known as SECIMOS, is to go ahead at the moment, according to French Industry Minister M Glroud. This colls for the encontagement of US companies to ally themselves with French

Though AMf, Harris, Mostek, National Semiconductor and Intel have been approached, no French company has yet shown any great interest.

Fruitless

WHILE Control Data is actively collaborating with the Jugoslav electronics enterprise Iskra on small computera, a similar agreement signed with Philips last year has borne no fruit, "The agreement has not been broken off by cither aide." a Philips spokesinnn told Computer Weekly, "hut so far nothing has

Colourful order

ACCURATE pigment matching is achieved by many industries with the spacialiaed systems produced by Instrumental Colour Systems of Newbury, Berks. The company has placed an In-ltial £300,000 order for microprocessor-based Digital Equipment PDP-11/03a around which the matching equipment is built. About 35 units are expected to be sold this year representing well over £500,000 business for DEC.

Sweet Systime

M22

TALLY

D

STOCKPORT confactioner

Your chance to command the Greek gods

WOULD you like to commend the Oreok gode? Then enter the Othelle contost baing organised by ayetems consultants Zeus-Harmes in connction with Computer Wookly.

It is to be played out in London on July 7 and the first prize will be a hand-cut stone chass set depicting various Greek detties with Zaus-Hormes as King and Aphredite as Queen. Lacaer immortals are represented by ether pieces and evon if you are not a chess player it's o prize worth having.

Second prize will be a programmeble calcu-

bottle of champagna. All contestants who gnt through the first round will be presented with

There already are about 40 entries and other Intending competitors should apply for entry forms without delay to Meurean Chapman at Zeus-Hermos, Shropohire House, 2/10 Cspper Street, London, WC1; Tsl 01-323 0637. Only entries on the official form will be considered and priority will be given to pisyars who

rapresent their DP units.

To while away the time between Othsile games there wilt be pienty of other attractions including two terminals linked to CDC's Cell 360 time sharing service on which a whote series of games, such as Moonlanding and various chess problems, can be played. There will also be more destinated to the terminate of skift such controls to the terminated destinated. on table tennis and darts.

It will be an absorbing evening so it you want to prove your prowess at Othello, apply for an entry form now.

First UK Multics goes to Bath

THE first Honeywell Level 68/ DPS Multics system sold outside benchmarks which won the the US is to be installed at Brisiol and will be ahared by Bristol and Bath Universities.

The £2 million mainframe will become the basis of a new Avon Universitias Computer Centre, and will support 60 interactive terminals in Bath and 150 in Bristol.

As exclusively forecast (CW, November 24, 1977) Honeywell has simultaneously announced the Level 68/DPS Multics system for the UK market. Delveries begin in the fourth quarter of this year. So far no more than two dozen Multics systems have been installed.

The Avon Universities Comouter Centre will complement the existing South West Universities Regional Computer Centre at Bath, which is equipped with an ICL 2980.

Originally developed at the Maasachuaetts Institute of Technology, and takan up by GE Multics passed to Honey-well with GE's other computer businesses in 1970. It is best known for the "rings of protec-tion," implemented mainly in hardware which effectively isolate aach user and application from all others. It is widely regarded as the most securo nardware and software system

available. Squirrel Horn has replaced Ita
VRC with a 64K byte Systime
3000 minicomputer based on a Digital Equipment PDP 11/04. tive users, and it was perfor-

Prices irom £946

Prices from £865

Prices from £1814

Prices from £205

Pripes from:

£364

Computer Marketing

Working with and supported by British manufacturers

Middectron high speed paper lane reader punch

SYSTEMS

Most LSt-1 1 Modules ex stock LSt-1 1 Systems on short delivery Customized is individual specifications.

Self study microprocessor, software / hardware, bilithing course includes Intel 8080 and 350 page text

All prices asclusive of VAT and one off

enti viser Rental available

Computer Markating.

641 London Road, West Thurrock, Essex

Tel: (04026) 7161 Telex: 896786

LAZS DECember II

Acoustic Couples

ASA DECYMILER II incorpo

TERMINALS

Ity Labe new range of British VDUs

Prices from: £495

NEW 7-1612 160 C.P.S. Bi-directional £1875

mance in transaction processing contract over the other finalists, CDC, IBM and DEC.

"Multics has an excellently eonsistent approach to interactivo processing, and the way in which file stores and virtual memory management are Integrated is very good," Dr Alex Nichol, director of the Bath University Computer Centre told Computer Weekly.

The South West Universities - Bath, Bristol, Cardiff and Exeter - at present have a network of linked ICL System 4s, and the plan is to overlay this with an X25 packet-switched network. A network interface processor to link the old with the new is being developed on a GEC 4070 minl, and an X25 interface is being developed on the 2980 at Bath.

Although some butch work will be run on Multica, the 2980 is designated as the batch

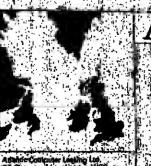
The next university due for new hardware is Cardiff, and it is planned that whatever the Welsh university chooses will be attached to the X25 network.

"To start with, we will concentrate mainly on the traditional university languages, For-tran and Basic, but we have visited tha University of Southwest Louislana, which has developed Pascal on Multics and we plan to put that up fairly soon," said Dr Nichol.

First user

NEW purpose-built distribution and service centre opened by Honeywett in Bracknett, Berkshire, has become the first user of the TPS 6/800 transaction processing system developed by stater sompany Honeywell Information Systems

completely overhaul US federal communications law for the first time in its 44-year history, and replace the seven-man Federal Communications Communications



ATLANTIC WHY NOT FLEXLEASE



used to provide race progress bullotine and the results of more then 30 classes competing. Quest of honour at the Honeywalt dinner efter the race was former Prime Minister Edward Heath, whose Morning Cloud come third in Otvision 1. He is seen here chatting with Mike Cutyer, president-director-general of He Nelwork Information Services and Mrs Cutyer.

GEC and Fairchild in talks on UK microelectronics firm

NEGOTIATIONS are still in products of its nwn in the prograss between Anierlean aemiconductor manufacturer, Fairchild, and the UK'a General Electric Co over the aetting up of a new microelectronics company in the UK.

Although Fairchild wnuld only confirm that it is holding talks with GEC "among others in Europe", and GEC would not commant, the indications are that a joint venture company

could be formed aoon. Raports point to microcomputers and mamories as the main product areas for the new company. Initial investment has been put at £50 million, a similar figure to that proposed by the National Enterprisa Bpard's microelectronics company, with which the Fairchild-GEC venture would be in competition.

GEC has no semiconductor

New US law would 'free' AT&T

LEGISLATION that would frea erests. at present prevent it from in a major draft Bill which would offering computer services, has been proposed by two US Con-gressmen who are also members

of the House of Representatives replace the seven-man Federal Communications Subcommit Communications Communication would also with a five-man Communication would also with a five-man Communication both AT&T and GTE to tions Regulatory Commission sell off their manufacturing into with more limited powers.

YOUR 370?

Flexiess, — low cost flexible busing on all 370 systems and peripherals — why commityourself to a long tesse un-recessarily. Please call us for details

mainstreum of standard devices, though it la one of the muln distributors of Intel parts in UK. Fairchild, which in the f8 hud one of the first microprocessor

chip sets introduced, now mainly scils the 3870, 8-bit single chip microcomputer as a second source to Mostuk.



H1520 VDU Microprocessor controlled serial/parallel

printer inlarface with 2K buffer Numeric and and cursor control keys Dual intensity

> Remote ediling commands Standard or reverse video Format made with insert

Printed in Great Britain by O.B. Limited. Sheepen Place. Colchestes: COS 26.1, and published by 19G Rietfices Electronic Press Ltd. Porset Hoger Stamford Street, London SEI 91.1.

Data Preparation

We have the capacity to pund your peak loads, his salups or regular work on 80 Column can Croydon: Nada Waugh 01-889 2244 Warrington: Ron Myer 0925 53391 Lowndes-Aiax

Computer Service COM Remote Computing W/CMS plus

Scottish MPs want ICL base in Dundee

A SUGGESTION by two Dundee MPs that any further ex-punsion by ICL should be neated in Dundee has been acknowledged by the company, olthough it has added that there is "little prospect" of any

manufacturing base being set up there in the near future. The two MPs Peter Dolg (Labour) and Gordon Witson (Scottish Nationalist) pointed out ut n meeting with Scottish Minister of State, Gregor Mackenzic, that the Taysldc Regionsi Council und five other Scottish local authorities had placed orders worth £6 million with

reply, ICL has said that nithough it has no such manufocturing operations, talks did Inke pluce with the Scots on what child be done in the area st the time ICL was formed by the nierger of ICT and English Elec-tric. However, these talks only icd to the furmation of ICL's

"The computer industry is not lobour Intensive in terms of mnnufacturing," said an ICL spokesman, "and there is little prospect of gruwth in our manufacturing employment

The two MPs also suggested during their meeting with the Minister that he und his collengues shimld steer to Scotland the proposed microelectronics Investment of about 650 million which the National Enterprise Board is considering.



RAIR

RAIR

Cursor addressing and sansing

Protected/Unprotected data and delete line keys Also available H1500 and 1510

United Kingdom, RAIR

For NEW DESIGN 1978/79 P11/60's The number to remember

021-559 3381 Phil in consequent constitution of the Water (Self-mechanism) of the Water (Self-Mechanism) of the Philosophism (Self-Mech

Briefing Survey of micro costs

ALTHOUGH the cost of micro processors is now less than Ellia solt, development costs necessary to ensure an emil purand with chilchent and ling tree software can be as much as \$40,000. This is one of the conchilops of a survey carried out by the Electrical Research ciation for about 50 clients in the UK and overseas

The survey showed that athough costs appeared high, the market potential for welldestloped products was vast Details of the project are being issued to participant compales in four volunces, two of which have already treen

Siowdown

PROFITS at IBM will be reduced by a slowdown in the rate of outright sales of handsome this year, according to charman hank Cary, Dver the part two years, jurnover from outright sales has elsen fairs, while rout al income has grown only 12% Cay also denied suggestions of theorganisation within 11151, and said that he aids meter to wheln 1980, when he will be see

A highest mini world minicompates teen, het Hewlett-Packard with the rety announce its lient principal to the signed specifically the the Hand-alone stephil beginning an and tens market. The new provides the bullt arunnid a 18. feit erite i .. processor developed on descess to. Restell-Pack and

Merer

the firm that provided atmosphere ind norkbrokers with missioned on on Euraband and fift Edged Securities, Industrial Since is being acquired by

Andahi at Chrysler

Meaning Amount over in the in management appropriate de principal of Chrysles L.K. at wenty, where it will replace will 360/65; It will be the soul 470, 1/6 In the tier the fail it Knys of Workester (177, 1906 22).

legisler call

animinate to the Pinnise on angineering, the sociation of Professional constant and animal animal

Number 607

At last—politicians wake up to micros whether the UK could get 64K RAMs on the market in time to be com-

petitive. His scepticism seems to spell

doom for the NEB's plans should a

Thursday, June 29, 1978

neglect, the computer and microelcetronics industries have been rediscovered almost overnight by politicinns of all parties, but the imminent General Election threatens to submerge the whate is a welter of party political in-fighting.

In the past week, Tory Industry pokesman Sir Keith Juseph has writien to Industry Minister Etic Vorley questioning the wisdom of the National Enterprise Board plan to set up an integrated circuit company; Lord Privy Seal Lord Penrt delivered a major speech on microelectronics; and Minister of State for Industry Alan Williams stressed the need for digital technology in telecommunications.

Sir Keith's letter underlined opposition of the sector working party of the National Economic Development Office to the NEB plan, and asked

Tories asked to abolish

Till second meeting of the Con-the nthet hand, delended go vero-

servative Computer Finance, a ment support, saying, "If you under the technique of the could assure us a California due it, was held last week to climate, not just the weather, but

Insac export division

Tory government be returned at the anticipated October election In his reply to Sir Keith, Varley said the questions posed were either preposterous or depressing, and he ea-pecially criticised the auggestion that

Britain should not seek to develop "wenith-generaling, employmentcreating industries based on new technology, but sit back and be content for the US and Japan to dontinate the market."

Varley is due to announce awards

under both the microelectronics and microprocessor applicationa support schemes this week (CW, February 16).

Despite the fact that a Tory victory in any future election la likely to mean the end of government money for the

Components Sector Working Party of the National Economic Development Office has naked the Department of Industry for much more money to support UK microeloctronics (CW) May 4). In a roport to the Department, the working party calls for a fundamental change in the Dol's original plan to support inulti-application 'standard" circuits.

Price 18p

A total investment of about £240 million is sought, with £80 million of that coming from the DoI. This is more than three times higher than the originnt sums suggested by the Deportment (CW January 19). The funds would be split between aupport for special circuits - the Dol's original area for support, and the new area of multi-application elecults.

Turn to page 18



Gamma sets up Series 1 firm

pased by the IBM Series I to the raditional minicomputer supphers, Gamma Associates, of Nottingham, hit her to special-

Moanwhiln IBM has announced significant onhunce. ntenis to the mini, including plans for a Cubol cumpiler, and extensions to moin and disc

Key element in Gamma'a

strategy is the COS/1 Cobol operating system developed by Compudata Systems Inc of Westport, Connecticut (CW, Frimuary 16). Gamma has ex-Ising in business systems on Dighal Equipment hardware, is a stabilishing o new company within the group to market, software for about £9,000 with Series I systems.

"We have sold over 100 DEC systems and expect to go on elling them in larga numbers," Dr Genrge Coggan, managing director of Gomma, amphasiaed to Computer Weekly.

"We felt we needed Series I to get sccess to n number of large IBM users who refuse to buy hardware from any other com-

minicomputer business that we eaunol afford to ignore it,"

There are no OEM discounts on Series 1, which means that companies like Gamina cannut mako mnney by selling the hardware. Novertheless tha company alms for sales of at least 50 systems in the next 18

COS/I is an interactive multitusk, ntulti-user operating system which fits into 26 32K. bytes, aupporta lacal and remntc terminals and a background

ICL introduces insurance package

the scenamic and tax olimote, then we might nel need govern-ment intervention." He bismed

the lack of venture copital partly

on "City suspicion and ignorance of thill sechnology," and claimed

that, regarding the tax laws.

sinctfull provisions for taxes

would have killed intel of hirth re

this country through their limits stoned ploying leads.

Bemorning red legs, West Berker pointed out the lost oppurtunities in "obtage in-

dilairy" pinduction of hardwork

and antiware, styrnled by plan-ning restrictions, ste. its said, "The only way for Hittain to get s 20th century computer industry

is in give small business o 19th

century applicated auvinoment.

What is claimed to be the unist effective measured puckage off. exele, that has been infroduced by 10.1 in suspense to demands troto its sustainers, bindetworks to the Lagle Star Group hannesting than after a last, the place of finder court for the rest of encountricing data and other May delivery of an Arndahl expenditures, the sered in May 16-15 in the 160; The recovering the Disaperation is to addition to cover for the

the nee State aid to the Industry,

years were expressed.

and some strailoty opposing

Consultant Michael Johnson

straigly attacked povernment others in promote the sales of

estreise, because it involved the

bearing to combatted representative

Alegana He recommended the

philipping proper set to remine the

trees was desired to failure "be-

came it required tumpetitues in

the obstate to obldic the sery

business in which they are com-printy. He claimed that cansult-are sufficient brokers could help

tiems aspect beller withius

Mainted Banker at CAP, on

the chief direct as R.L. cussuppers who have parchased there market ex and affect tenta: and fearer constructors where the is current for damage by it I server uncommon for afficient for the are let organizated for the area.

It'l emphasises that under the anywhere in the world and plan all faulty equipment will be regulaced with new kit.

The plon automstically pro- ditioning breakdown. The convides cuyer against remote ter-

respondenties the properties IBM pulls out of Nigeria.

minals and data linka at un-

FOILOWING its withdrawal also closed down its subsidiary.

opis in the News

from India this month (CW, the company interids to sell June 1), IBM has decided to pull business activities to a locallyout of Nigeria rather than sub-unt to government directives to naps also continue the mar-sell 41% of the local subsidiary to naps also continue the marhaps also continue the marketing of IBM products on Nige-As in Indonesia, where IBM rian territory. Migerian nationals.

COMPUTER WEEKLY'S INSIDE NEWS Programmer Notice Puzzler Softwars File Leyland's data centre

Tricing of inginerals of the second business system has been the fire of the second se

ctaining to speak for the pro-femiorale has been officially com-persed and the first theirmor of the institute of Data Processing Management, Heville Taylor, easterns the role of the new body

ALSO Gunst Competatiview of SCUM Fecus un management Solden NPL micra project Downstone Fully a world challenger Life's Mythodology

pictures

Information Reven
Letters to the Editor
Sales Bit
Han Rid, Block A
Worldwide vigurdets
service plan APPOINTMENTS: PAGES 21-47

Diery Dates Computations report and

batch straam. Compudata has

VANGUARD 7600

THE MINI-MAINFRAME

Semaphore Computer Systems

Expandable to 2 Megabytes memory 9600 Megabyte on lina disc storaga capacity. Powerful multi-tasking background and real-time foreground op. systems.

> TOTAL Database management HASP/RJE COBOL RPG II FORTRAN IV BASIC CORAL 66

> > Enquirias to: D. J. Tovay

Available for OEMs as well es end users

Semaphore Computer Systems Limited

BORDEN HOUSE, BORDUGH ADAO - SOOALNING - SURREY TELY - 6POALMING 1048 881 563

Thursday, June 29, 1978

Malcolm Peltu 01-261 5033 Deputy Editor
Tony Higgins

Advortisoment Menager 01-261 8359 Cleas Ad Monager 01-281 8597 Orlon Durrant

IPC Seatricel Electronic Press Ltd, Dorsa's House, Stanford Street, London, SE1 SLU. Telepines: 01-281 8000, Telepines: 7 Teles: 281 37 BISPRS G

Sranch Offices: Blimingham: 202 Lynion House, Road Girminghem 228. Telaphone 021-308 4838

Manchester: Siethern Houre, Telb Stretford, Manchester M32 Telephone 061-872 421 I

New York: 206 East 42nd Street, New York, NY 10017, Tel (212) 827 2080 Telex 421710 Published weakly on Thursday

Hogistered at the Post Office ac newspaper. Price per copy 1Sp F IPC Spainers Press Ltd 1878.

Members of Computer Weekly staff may be contected directly on the extensions listed below. Other de-partments in Oores House may lis obtained by dialling (01) 281 8000.

281 8344 281 803t 281 5303

281 8028 281 8808 281 8170 261 8038

281 8413 281 8843 281 8042 281 8543

287 8757 281 8109

881-872 4211

821-388 4838

281 8028 281 8097 281 8019 281 8098

281 8454 281 9174

081-872 4211

021-388-48SB

281 8018 281 8878 281 8818

Kelth Jones
Tim Palmer
Peter Hewitt
Rory Johnston
Mortin Banks
Robin Webster
Bernard Alls n
Ooneld Kennet
Mike Marples
Oon Mirchell
Darski Rampal
Chris Youett
Nency Pocook

AOVERTISINO

Cleastfied Citele Prier Eddie Farreit Mark Williams John Forrar Paul Windridge Nanette Olibbe

Competer Weekly Is sent free of charge to the tollowing cologories in the UK and Effe cohy. Company structure, company secretaries, reassection services accounts, civil between two parties, company of the control of enangement/computer controligate, lea-turers cod leschere, DP magagers/ engarythors, systems e helyste/4 8 m officers, programmers, aperators, computer discusses, field engineers.

Computer Weakly has a directallion such wask of over \$2,000 including the highest fully requested circulation is the UK. The International edition; which is published ju times a year, has a circulation of over \$4,000.

This month marks the tenth annivaraary of the shooting of Andy Warhol by Valerie Solanaa, for wham SCUM stood for Society for Cutting Up Man. In this Guest Computerview,

Mechina Intelliganca Unit at Edinburgh Univaralty, warns that, when people are chronically and massivaly deprivad of jobs, tha sama moods of alienated frustration as those axpreggad in Valerie Salangs' SCUM

Manifaato could build up quickly with tarrorism, recial alaughter and wer not excluded in some social circumatancea. SCUM would then stand for the Society for Cutting Up

Beware SCUM—the Society for Cutting Up Machine-makers

shot Andy Warhol. imate robot. The corporation puts it out as a promotion gag.

For her, SCUM stood for Society for Cutting Up Men. With brilliant intensity her SCUM Manifesto propounded the bold idea of exterminating the male of the human speciea. thus frealing the world's women to develop their own destinies. Har idea was to fill the gap with

My mind went back to poor Valerie's diatribe whila reading Colin Hines' The Chips are Down (25p fram 40 James Street, London, W.i) published recently by Earth Reacurces Research Ltd. I realised that a new kind of craziness may one day be sparked off - not man-hating but machine-hating. In seven by modernising our own plant terse and sombre pages the author warns that computer-Induced mass unemployment may attain disaster proportions Well may Hines say "There will in Britein, and certainly will do ba no easy, wand-waving soluso if a major national effort to tiona" analyse and cope is not

Hines argues that it is the microprocessor which la suddenly turning dreama into breatening reality.

What happens when paopla are chronically and massively deprived of jobs? My reading of history is that the very same moods of allenated frustration meke obscure brute-force computations more comprehansible to the machine's aupervisors, is clearly one of the more constructiva directions. Allied to as those exprassed in SCUM can that, the whoia area of build up quite quickly with tarcomputar-aided education and rorism, mass hooliganism, racial training acquirea a new, and esslaughter, and war not excluded pecially beneficial, significanco. n soma aociai circumstances, as will stand for Society for Cutting Up Machine-makers.

Luddism never yat turned beck the industried clock. So other responses will heve to be found to such facts es the fol-

 Micro - automation has already shattered the Swiss watch industry.

In 1970-75 National Cash Register reduced its manufacturing workforce by more than

. In 1970-76 US Western Electric's manufacturing force drop-ped from 39,200 to 19,000 A 75% cutback la additionally expected in fault-finding, mainteoanca, repeir end installation.

 Similar trends are now in supermarkets, in the garment trade, in offices, in dealgn shopa and elsewhere.

Overall, unemployment in Britain is projected at the level of 5 million by 1990.

Hines also takes note of the growing impact of the reprogrammable robot. Private

JESN 0010-4787

Oceanic Rentals For most company managers, fascination with computers is limited to complaints and de-Short term rental and leasing manda for explanations. Although it is not unusuel for the DP department to be the last of industry standard terminals, Printers - KSR, ASR, 30cps, 120cps to be informed of eny new com-Portable printers – built in acoustic coupler pany davalopment, it neverthe-less has to be ready to accom-VDU's - Newbury from stock

Acoustic couplers: Paper tape reader punches Hewlett Packard desk top computers

15 Bevis Marks, London EC3A 7LH, Telephone 01-283 3667

referring to the latest oil slick. cent references to the mush-The acronym SCUM was or- rooming US robot manufacturer Iginally coined in New York by Unimation (CW, May II). The the tragic paranoid Valerie job application form shown has Solanas wha, on June 3, 1968, been filled in on behalf of a University of the control of the contr

But the joke has disturbing

overtones. Vaierie Solanas' fan-

tasy of replacing male persona

by machines acquires a hint of feasibility — but females are

equally vulnerable. A recent

Times article described a word

processor as "The four thousand

pound typiat-substitute that will

Where do we stand as com-

putar peaple? We started it,

The situation is more acute

because there are not one but two problems building up: (i)

job-destruction, (2) the need to fight overseas competition both

and by devaloping automation

All that a computer man can do is to see if his own professio-

nal skill can be brought to bear on some sector of the problem.

For example, contributing to

'the human intarface", so as to

Yet (2) seams to aggravate (1).

systema for sale overseas.

soon pay for itself."

shortening the working week. None the less, I prefer the "fourplus one" day to the "four-day' week: The "one" stands for allday educational release at empioyera' expense. Such a scheme would ganerate work for the education industry, which Itself can absorb with benefit Indefinite amounts of automation to sugment, not displace,

If we computer men do not concern ourselves about the good and evil we sow, then u day may dawn when wo do indeed have to watch out for SCUMI

"SCUM Manifosto" by Volerie Solenes, New York: Olympis Preso, 1968 (peperback).

-APPLICATION FOR EMPLOYMENT-

NAME Unimsie 2000 9 SOCIAL SECURITY No. None AOORESS Shalter Rock Lane, Denbury, Connecticut 08810 AGE 300 hours (by softwere extension — 15,000,000 hours) SEX Nono HEIGHT 5 It. WEIGHT 2,800 lbs. tife EXPECTANCY 40,000 working hours (20 men-shift years)
DEPENDANTS Human amployees of Unimetion Inc.
NOTIFY IN EMERGENCY Service Manager, Unimetion Inc. (203/744-

PHYSICAL LIMITATIONS Dosf. dumb. blind, no tectile sense, one erinod.

SPECIAL QUALIFICATION Strong (100 lb. lood), untiring 24 hours por doy, Issrn Isst, navar lorget except on commend, no wago increose demends, accurate to 0.05" throughout aphoro of

HISTORY OF ACCIDENTS OR SERIOUS ILLNESS Sullored from Porkinson's Olsesso Jainos corrected). Iget hand (since repinced). losi memory (restored by cossette), hemorrhoged (sutured and

POSITION DESIREO Die cast mochino operator

OTHER POSITIONS FOR WHICH QUALIFIED FOIDing pross, plosing molding, spot welding, erc welding, pellotising, maclimo loading, conveyor transfer, peint spraying, investment costing.

SALARY REQUIREO \$4,00/hou

RELATIVES IN THIS PLANT Five 2000A Unimotes in lorging daportmon LANGUAGES Record-ploybook, essembly. Fortrail

EDUCATION On the jub training to journeyman skill leval for all jubs listed

REFERENCES Gonsrel Motoro, Ford, Ceterpillor, Babcock Wilcos, Xnrn, end 85 other mejor manulacturers

One must sympathiaa with final outlats. SCUM this time union pressures for further The job application form on behalf of a Unimate robot

FOCUS

8) excalled itself when two combined to knock the DP

menagament college. It was ment passing through the col-lege expressed a keen interest in computing applications — an vement apparently denied

them in their own organisation.

The fascination with DP extended to close involvement with linear programming and computer based marketing Perhaps these perticular macagers are a special breed, yet to be released into the averege com-

fusion is, of course, better liaison and communication, it is not the DPM who is out of touch; it is more often the company management Maybethe college could be encouraged to run specific courses for DP managament. The curriculum cou ment. The curriculum could provide insights into simulated board-room sessions and group policy discussions. Finding put what life at the top is all about could be hin end perhaps even rewarding. Even better could be a session of two of exposing company management to real life company to popular company. modate the new application tha wack after aext. Far frommaking close encounters, most ents keep themselv as far removed from the DP acene as possible.

SELDOM does a week go by in the computer Preas without DP management being on the receiving end of aome heavy 8) excalled Itself when two apparently random articlas apparently random articlas

in another article, the DP First to wield the cudgels was manager is blemed for proan article on a certain ganeral ducing too much information. Current management Informamade clear that the organisera tion systems are resulting in a held a very poor view of DP management. General management and blama for this unhappy state of information affeirs is natu-rally, that of the DP department. In this case, not even the benafit of any doubt is given it is the Information specialist from the DP team who is the villain. The basis of the threat is that DP and ompany teams apeek in different languages.

The answer to all this con

management belief, the DP teama do consider themaelycs as being part and parcel of the organisation, even if their particu-lar parcel comoa wrappad in layers of technical jargon and

DP management is only too well aware that its involvement has room for Improvement and It does not take the services of a omputer to inform the DP

Ten-year chess bet nearly over

The 10-year period of Oovid Levy's computer chass but ex-pired at the and of August, in August, 1958, Levy atorted a that no computer program would win o motel ogainst him within 10 years.

The final match which with determine the motel of the motel of

determine the outcome of the bet will be played during the tost few doys of August. The exoct venues have not yet been docided but Holland, Canado ond the US are the most likely countries to host the event.

Thore may need to be more than one motch and they may take place of different locations A warm-up gome is planned for July 25 opolast a progrem which will most likely run the Cyber 178 of CDC'o plant at Ardon Hilla, Minnespolls Arrangements for this have still to be confirmed.

Computer fraud conference

A CONFERENCE on computer fraud and its prevention will be held at the Hilton Hotel, London WI nn July 4. it is subtitled The Protection of Computer Use from Plagiarlsm and Abuse.

Speakers will include Colin Tapper, Fellow Tutor in Law at Migdirlen College, Oxford; Bill Dunn, UK mintaging director of Pansophic Systems UK; and Michnel J. Comer, corporate security cu-ordinator of Esso.

Forther details can be iditalited from the organisers, European Study Conference Ltd, Kirby House, 31 High Street Fast, Appingiram, Rutiand, Leles LEIS DPY, 161,057 282 2711.

Gamma sets up Series 1 firm

• From front page already installed eight systems

and has another 100 copies of COS/I nu order. Gamma gets lis own Series I in September: IBM Itas now announced its

own Cnbnl compiler for delivery in the third quarter of 1979. which will he compatible with 370 Cobol and costs £2,365. A ncw processor, the E model, with fustor, high density memory has been added. A disc subsystem with capac-

itles ranging from 58 to 258 Megabytes will be available next spring, aa will a floppy-disc magazina unit which takes 23 diskettes. Software enhancements include facilities to exchange data with 370 mainframes from the 135 upwards, Structured Programming Facility which allows TSO users to offload editing from the mainframe on to Series 1, two-channel switch has also been edded, enabling Series teems that their level of action is input-output channels to be all too often, in a remote end switched between twn proces-

Ten years ago.

COMPUTER WEEKLY

TEDDY Tinking chose a computer motif to decorate some of his TEDDY Tinking chose a computer must to decorate some of his treations which coincided with the first ever Open Wimbledon. Computing power intended primarily for software development in data communications was installed in a new wing at English Electric's Kidagrova factory. Plans were being made by the London branch of the BCS to provide members with a series of meeting points in the subsities. Following a recommendation, made by the Hotel and Cataring Economic Development Council, groups of hotels linked commercially or geographically were to initiall computerised reservision systems. A data communications network that could be the model for a settoral system was to be established within the National Physical Laboratory at Taddington.



EPSS consists of Ferrenti Argue 700-based pocket-switching exchanges in London, Menchester and Glesgow.

lel ring manuged by small, iden-

tical software kentels resident

on each machine. These are

written in Concurrent Pascal.

Only the interface between each

computer and the ring must be

specialised for the needs of tha

Dramus systems software is

written as a single program.

Once compiled, un independent

system generation program

officates its comprisents among

the unitvidual commuters for

loading, in this way a program

can be reliacied on larger or

smaller configurations without

change. The systems suftware

particular type of device used.

Scicon and NPL develop system based on micros puters. Titls is an 8 Mbyte parsi- and may be compiled saparately.

The system will be particu-

applications where many activaliso be possible by modelling

Ities are taking place in parallel. each part of the simulated sys-

larly suitable for large scale

Fust file access will be possible

based on a chain of microcourputers that can be extended. smost indefinitely, is being developed by Scicon in conjunction with the National Physical Laboratory. The project is being supported by a £30,000 grant from the Advanced Computer Technology Projects fund and a further (30,000 from Scicon.

Il is planned to have a prortotype of the system, known as Denios, really next year and first application areas are expected to be in real time routral transaction processing and communications

The basis of Dennes is a high capacity cummunications link capable of connecting up to 25tt

ran be written or support particular applications, and applicainm programs can be written in n different reni time language, Newcastle Council to stay with ICL

AFTER putting the madet met to tender, Newcastle-upon Tyne Council has decided to stay with ICL and ordered an ICL 297it in preference to an HIM Will system. The 2970 is to be delivered

It will replace the present 1904S, and provide the power and facilities needed to imple ment an integrated linancial, land, property, personnel and housing management system, probably using ICL's IDMS

dalabase management system. Running under VME/B, the 25 Mbyte system will also support a communications network that will feature 39 cash receipting terminals handling

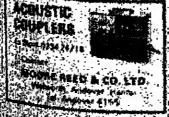
Electronic music festival

poses will be featured in the 1978. Ediaburgh Featival of Electronic Music, to be held between August 31 and Regularizer f. coinciding with the Ediaburgh Featival.

The Electronic Music Featival a speciated by the Experience—M. Arts Society (Felinburgh) in cooperation with Hadio Forth (Edishurgh) and the Scottish-Arts Council.

Ticlust for the seature of the seature of the seature.

Triver for the six scinearts to review for the Edwiningth 11658 Fortiret Society Sox Office, 188 High Sweet, Royal Mr. Edwiningth



louising tettls in 26 offices; un IC1, 7502 terminal promessor supporting eight display termorals for program development, another 7502 handling bununisation and vaccination record inqueirs, and various other termitals in schools and

INTERRUPT

the engineer's department.

SOME years agn u large comouny installed its first computer t had bided ita time to ensure that the equipment really had the necossary throughput capacity, with efficient software and systems and adequate

The first and biggest jab was sales invoicing, 10,000 invoices a day to 250,000 dolivery points. A considerable cuatomer master file wasset up, and after only 125 program trisla, the ayatem rd able to undate this large and complex file. All went well for e manth

then disaster. Everything stop-ped for a store parity sailure. ke run - parity failure, again; change tane deck - parity fallure; read the offeeding record manually, which happened to be that for Elstrae Rural District Council - parity feilure. So engineers descended from far and wide and laboured for three days and nights. And the coriclusion? A design fault triggered by the bit pattern of that particular

It is worth noting that the computer that had been ao carefully chosen was the third of a new and very advanced series. Moral: it's and enough to bide

@ This proof o ES Incorrect artes when he M. C. Hangbok of Burk-tamanet, Herrs

your time if you are still a plou-

EPSS open day shows UK well up with overseas rivals-

three-network link, denumstrations of a new low-cost graphics system, and access to the BISC Ceelax text display system over a computer network were among the features of the first

EPSS Users'Open Day last week. The sdvent of X25 networks has tended to push EPSS, the Post Office's Experimental Pucket-Switched Service, into the background, but the demonstrations made it clear that

ful real time simulationa will

tem on an individual computer.

ARPA network to a computer in Los Angeles. An experiment on a third network, Satnet, was conducted from the Los Angeles computer which involved connections vis the Intelsat IV satellite to computers in Boston, Oslo and London. Satnet is on experimental network with ground atations in Goonhilly, Cornwall, in Sweden, and in Virginia, US, and the purpose of the test was to measure the amount of time which data

up with their counterparts over-

Steve Treadwell, of University

College, London, demonstrated

vis the big experimental US

each ground station. Dale Sutciiffe of the Atlas Division, Laboratory, demonstrated that packet-switched networks could be used for graphics work by using EPSS to run a demonstration of a graphics package. Graphic Option Controller.

transmitted on Satnet spends in

GOC is a microprocessor-

A DRAMATIC transutlantic research institutions are right based raster scan display generator which enables on orlinury alphanumeric VDU to be used for graphics work. It was developed at Surrey University and is marketed by Sigma Elecnetwork interconnection by es-toblishing a link through EPSS

In the demonstration it was used in conjunction with a GEC 4070 computer installed at Rutherford and linked to London vla EPSS.

The National Physics Laborotory silowed a number of demonstrations involving connection of EPSS to its own inhouse network. Among the demonstrations was network access to the BBC's broadcast Ceefax teletext system for putting up text on a TV screen. NPL has developed an interface which takes the decoded signal from a standard teletext receiver and translates it into a character

Open day demonstrationa were given at five centres: Glasgow University, Rutherford Laboratory, Harweil, Nationai Computing Centre, Manchaster, University Collega London and Sperry Univac, London.

DP Managers-if you're running OS orgoing OS you may be generating your applications the hard way.

The powerful, purpose-built tool for the job is TSO 3. Datasolve's unique Interactive Program Development service.

A combination of structured programming and full cost control. Many large companies, including Datasolve Itself, are already finding that TSO 3 gives them:

More controlled maintenance of existing systems.

- Shorter time scales on major new systems development. - Up-to-the minute cost control and budget comparisons.

- A better motivated programming staff with no turnround problems.

With TSO 3 in your OS environment you've simply got what it takes to boost your productivity and keep tabs on development costs. You'll certainly want to know more.



Carol Collier is waiting to hear from you at: **BOC Datasolve Limited** Datasolvé House, 99 Staines Road West, Sunbury-on-Thames, Middlesex. Telephone: (76) 85566

Nationalist exiles

IN conversotion the ather day with Gerry Fisher, ebullient ex-president af the BCS, I dlscavered that he is sisa president af the La**ndon b**rench af the Scattish Nstlanal Party.

I have spent several days naw struggling ta get my mind round the idea that there cauld actuslly be a Londan branch of the Scattish National Party. I keep imsgining that next I will hear of a Calro branch of the Warld Zianist Organisatian.

l suppase it's just one af those numberless cantradictions that aeem, in an - exchange.

endearing way, to characterise these smazing islands an which we live.

• The newly formed conference compeny, Informe-tion Studies Ltd has taken up residence in the grandlytitled Regol House in Chorleywood, Herts. But for the time being they are without a phona, as the Post Office Is having trouble getting them lines quickly. Which is etrenge, as Regal House used to be the local telephone

Noise of your choice

DOES silence get you down? Are you o faunder member of Peter Simple's Friends of Naise? Then they have just what you need at Hammacher Schlemmer, the New Yark emporlum af things for The Man Who Hss Everything.

It is an electranic sound condilianer, called Environments! Sound X, ond it consists af a box that just sits there and makes noises. Yau can select white noise, randam aurf effects, the saund af single wsves breaking, light rain, a steady dawnpaur, ar s wsterfall. Yau can even, If yau wish,

All this is meant to aid relaxstion, or concentration at wark, and anly casts \$129.95.

Do not scaff at Yankee Ingenuity—it mskes money. In some American juke baxes yau csn put in a quarter and chaose. s recard that gives you two and a half minutes of slience.



ONE af the fringe benefits af being director of the National Camputing Centre, ss is David Firnberg, is that you get to present bouquels to award-winning aperstars. Firnberg is seen above with the finalists in Wardplex's Operator of the Year campetition far ward pracessing typists.

Mrs Lesley Drsper won the award far her dactylagrnphic expertise, snd far writing the fallawing paem: glide through the words now with the greatsst of ease, As they form an the screen at a fouch of the keya, I can change them, arrange I hem, save or delete,

Form letters from phranes Wordplexing's no neal! I sm sure you will agree that Pam Ayres must laak ta her

By the way, there is na truth in the rumaur that David Firnberg Is to judge the Miss Warld cantest next year.

Don't panic—take a more flexible attitude to work

attended the recent 2900 Club Conference on the "Ecanomic Impact of computing in Europe over the next five yeare" was lieble to be assalled by a powerful sense of deja vu.

It was not that the subjects were outdated. There was frequent mention of microprocessors and distributed and word processing and two speakers discussed in somo depth the economics of minis versus mainframes.

The cause of the feeling onc had been here before was tha cantinusd presence of the spectre af widespread unemplayment that pervaded aimliar

gathorings 20 years ogo.
The prophets of the middle 1950s were certain that the rapidly widening use of computers wauld signal the whalesale disappearance of affice

In particular, banks and insurance campanies — bath plan-eers of office outametian and its mast abvious baneficiaries wauld, they were convinced. soon be operating with skeleton

What happened, as we naw know, was that the nature of many affice jobs changed. Many men and women who had spent

...let us quote you for

the low-cost

M30 ASR

Paper Tape

Printer Terminal

plus Extel Contract

Ring 01-739 2041 Telex 27595

IR) Extel is the Registered Trade Mark of The Exchange Telegraph

Company Limited, 73-76 Scrutton Street, London, EC2A 4TA

Maintenance Service "

The People Who Maintein

Beck in the mid-1950a, the prophete of doom were convinced that computara would put meases of office workers on the dole. But what happened wee that the neture of meny office jobs chengad.

At the 2900 Club Conference, aays LAURA TATHAM, speakers and dele-

the production industries.

Increased affice employment was, in large measure, a direct result of increased use af camputers were instailed by organbehalf af those now working in

representatives agreed, not anly that it is impossible to stem the tide of pragress but that auccessful explaltation of new technalagy is a necessity for

in industry will exactly parallel

that in the affice world. The ratio af blue to white collar most countries far some years.

Nora and Alein Minc, is a straw n the wind, remains to be seen. point for many kinde of goods — assuming these are produced in current volumes and thet Third Warld cauntries remain

least in sight.

caused sweat shop owners (and a few, shrewd managers of data prep departments) to crowd as many machines and operators as exploit its full potential.

The first word processor, a few, shrewd managers of data a few fereitae and of serving others in any capacity, might lead to many machines about of their present diseast out of their present data to many machines about future develop ments shout future develop ments shout future develop. This is dangerous. It will in

getee wera voicing alorm on behelf of those now working in the production industries. While to ignore such propheciee would be irresponsible, hare the urgea ue to avoid taking panic measurea

liks minutes and reports.

reversal of traditional resistance

Robot technalagy is by na

unskilled human being.

Another powerful deterrent is tha size of the sums already in-

vested in conventional plant and

equipment and the astronamical

There is a third, less tangible

stuff the highly automated Purls Metro to some extent, because vandalism ran ranipant lu unmanned stations.

To Ignore the prophecies suffer the Intolcrable baredam of endlassly retyping amended versions of dacuments

Factory managers und warkers are at least as cunservative as their office counterparts, Eyen were there an abrupt ta change, an almost unthinkable cvant, there are still formidable abstacles to the haadlung intraduction of automa-

designers achieve tha degree of flexibility loherent in even an

production-ariented society.

Why shauld the implications af this be unemployment except, perhaps, far a few transitional years? There is already substantlal unsatisfied demend far such services as medical and dental care, provision of leisure activities, gaad as distinct fram exhold repairs, to name but a few.

... It has often been suggested that most of us will have to mester several different kinds of expertise in the span af our warsing life

The need to educate Britons at least out of their present disdain of serving others in any capacity, might lead to many

Tel: 025 671 2910 Teles: 858815 ypothesis computing techniques to aid-us (The women who work lot F in these endeavours.

Newbury

UNLESS palltical and economic institutions situation, it would be better for the governequip themselves to use the techniques and ment to sit tight and do nothing. capabilities offered by computer technology, society could be faced with disaster.

at the "Computers and Peripherals - 198b and Beyond" conference at the US Embassy. Tolerate It; they will react irrationally or

Lloyd, who is chairman of the House of Commons Science Sub-Committee, opened the computer seminar with a talk entitled "The Political Control of the Silicon Revolution," but was himself dubious that any such control should be exerted.

In fact he suggested that as there was a great danger of the wrong political decisions being made the to a lack of awareness of the "There are those who think the test

This was the minin thesis of a tolk by in the way ond stort stating which industry Conservative MI Ian Linyd, when speaking may do one thing and which industry may not. If this does necur, people will not even possibly violently. It is profoundly important that they learn more about tech-

SOME details of the world's on the hardware on which they most powerful general purpose ore run, raises the question af

'Adapt to computers or face disaster'—MP warns

"The government must nat promote false confidence," said Lloyd. "They must not get unlogy. The Japanese have realised this, as have the Americans, who have always had a

passion and flair for technology." But one of the difficulties in achieving such an mimirable sinte of affairs was that there were two schools of thaught, both

"There are thuse who think the techno-

al past events and point out that society hos taken them in its stride despite famine. world war, and other slumps.

"Then there is the appenlyptic view where people say that we are approaching an "event horizon" - a discernible black hole in technological space. They believe that we have little lime to come to terms with the problems. . . . 1 am inclined to this latter

Other speakers at the seminer included John McNully, managing director of Modular Technology, who described the advances we may see in computer peripherals during the 1980s; and Gordon Scarrott, manager of ICL's research and advanced development centre, who outlined the "Effects of Merging Lagic ond Memory In the 80s."



LLOYD . . . "better for the govern-

NCR's latest sorter can handle up to powerful system' 750,000 items a day

terminal and a computer cultaye-tem for reading and so ning che-quee and other documente are the two latest additions to NCR's financial range.
The NCR 2251 te a micro-

based teller terminal that can operate as a stend-alone system or be upamded for anline comunicatione and date capture

it can be progrommed via its keybaard or, if the terminal is operating in an online mode, prorame can be lacked from a central camputer or ceesette unit. In addition to etandard tellar-

rangaction functions, the 2261 offers the ability to enlouiete intarest, and it can perform positive proof of deposit at the taller eta-lian and automatically produce

The tneerted forms atation

A LOW-COST electronia teller used for passbooks and printing on verious inserted documents includes a 80-column matrix

> The NCR \$780 cheque and denument earter le a modular gyetem that can be taltored to andle between 60,000 and 750.000 Items per day. tt begine with a 24-pooke

eyetem that oen proceee 1,200 espanded with optional features. A cortor-controller will be released by NCR early next year

and this will reduce the subsys ten'e depandence on the host eystem es well as praviding mu A duel MICR/OCR, reading

facilities with logic to reduce misranda end item rejents by doing a digit-by-digit compelles in will also be released in 1878.

62 order yet in the UK. This has been placed by NEI Mechanics! Engineering which is decentralising its data processing aperations by replacing an IBM 370/ 145 at Gateahead with seven Level 62s. These will be installed at locations all over the country. The transactian processing

Honeywell

gives 50%

boost to

Level 62

mance of Honeywell Level 62

computers has been boosted by

about 50% with the introduction

of a respectfied processor, 200

Megabyte disc drives, transoc-

tion processing system and 16K

enabled the maximum main

512K bytes.
At the same time, Honeywel

has announced the biggest Level

nemory size to be doubled to

system annaunced by Honeywell for Level 62 is called TPS and, accarding to Haneywell, it occupies less incmory than mast svullable packages while affering fuster termins | response The boosted transactian pr

cessing capsbility of Level 62 should make it a stronger com-petitar for the IBM System 34 and the battom end of the prajected E Series from IBM.

The 200 Megabyte disc drive Introduced far Level 62 is part af a new family of disc stores called Large Storage Module Drives, LSMD, manufactured by Magnetic Peripherals Inc. This is the firm in which Honeywell has a large minarity share, the majority being held hy Control

their lives in clerical work were turn raised cries of alarm on retrained to edit or prepare input data or, later, operate terminala. Althaugh in individual organisations natural wastage was

The demand for information

speakers and delegates in their

little if any averall decrease in puters. More and mare camsatians which, ance content to use the methods that servad

their ancestors, realised these ad become inadequate in the new fester moving enviran-

allowed to take its toll, there was

processing has naw become insatioble. There is currently a serious femine of office warkers n London and ather urban centres, and of computer peaple

At the 2900 Club Conference.

that could lead to Ill-judged and perhape irrevoceble deciaions. This shortage is in itself often due to the unwillingness of girls

Union and management

What, then, they asked, la ta become af the army of warkers wha will be displaced by microprocessor-driven rabats? It asems highly improbable that the pattern of development

workers bas been in daclina in Whether ar nat the halt in this migration that has accurred in France, as noted in the recent report to that cauntry's Prs-sident, "Rappart sur l'informatisatian de la Société" by Simon

cost of retoaling for new tech-Furthermore, the saturation but probably more intractable and persiatent deterrent to widespread automation in any sphere. That is human nature impoverished - seems to be at. itself. There is, apparently, a

There is a school of thought that affirm history can teach ue nothing. But is this true? One tning we can certainly learn
from retrospection is that the
speed of technological development will strong fat outpact
human ability to appreciate and
exploit its full potential.
The first word process.

by scarcity of staff.

fcrent case; far thom tha choice may often be salltary working iir Intellectual stagnation.)

It has been necessary tu re-

made, nat anly at the 2900 Club

What history shuws, us Basil Causins emphasised in his keynate speech at the conference, I the importance of preserving a sense af perspective. The suci and econamic effects of tha industrial Revalutian were unor mous. They were also sprand

Neither imagination nar the means as highly davalaped as a most sophisticated techniques few outstanding and widely we have yet been able to devise publicised examples suggest. It will be a long time yet before is capable of predicting io any

agreement is that we are moving towards a service- rather than a

fundamental need for persanto-persan contact in many

Canference but by many other thinking people, in print and on the air, would be irrespansible. Clearly enormous changes are on the way. The question is -

aver marc than a century.

detail the ahape of things to Tha anly aspect an which there eeems to be wideaproad

Buish Dasign and Minulacture "Low Cost "Talutype Compatible

24 knes of 80 charactors par line Switchoble band rate from 75 i 9,1100 *Outil Interlace ~ CCITT V24 an 20/60 in A current loop 'Haid Copy Pilnt out 'Switchable Init/full Ouplex 'Video output for External Monitor

NEWBURY

The home of Low Cost

Visual Display Terminals

MODELS 7004-7005

*British Oesign and Maculecture *Madel 7004 (64 Cher. Set) *Model 7005 (96 Cher. Set)

*24 lines at 80 cherecters per line *Switcheble beud reta trom 75 to

'Ouel Intertace — CCITT V24 en 20/50 mA current leap

'XY Curso: Address
'Pratocled Field Farmet, Blick and

*Roll or pega made
*Velao sulput fat Externel Manitars

'Hard Copy Priot out by line a

Models 7001-7002

Inverse Vidao

Model 7000



Bittish Dasign and Manulectura Low Cost Teletype Compatible 24 lines of 80 characters per line witchable bend rate from 75 to *CCITT V24 interface *Switchable hall / lull Duplex *Green phosphor scresn

PRICES FROM £535

Laboratories Ltd. Head Oilles & Seles King Street, Odiham Hampshire RG25 1 NN rallon into PTS 6000 brenking an Anidahl 4711V/li with 10 extra instructions, and that multi-Foar in five of the minis made processor versions of the M-200 al Rombuuillet ga far exjurt, are configured with each prowhile imports of conquarems for

NEWS IN BRIEF Fujitsu gives

Philips to build details of 'most

most powerful general purpose computer, the Fujitsu M-200

have been clarified by the com-

200 CPU is an enhanced version

Fujitsu now snys that the M-

only 30% of their vidue. PO policy change

their manufacture amount to

2,300 minis

at Rambouillet

THIS year Philips plans to haild 2300 P800 series relationarpaters

el lis Rambauillet plunt, neur

Peris. Half af the output will be

fully canfigured minis for use in

process cantral and other appli-

callons; the remainder will he

shipped to Sweden for incorna-

WHEN a Post Diffice policy change takes effect in July, it will no langer by necessary to rent an infditional exchange. factor each leased bute roadent The Past Afflice considers its modems are reliable coords to do without a pempte test buility for PO engineers

Prime time

TO provide a time sharing burgan service ha stincinial and civil engineers, a Prime filld system has been frestalled by Enber Computer Tiperations of St Albans, Herts.

Division may close

THE plan for Cincinnaci Milacron to sell its commercial systems division to Call facernational, a company set up by Milscron employees (CW, May 18) has foundered because agreement could not be teached on price. Cincinnati Milacrion's alness systems division, set up to win a wider market for the alcomputers, which the Ohiobased company hulld's to control its machine-tonia, is now likely

to be closed down. leigian order

RDERED 18 months ago, two CR Criterion 8570 mainfrantes been installed at the Belgian Plnance Ministry, where they will replace two NCR Cenusy 200s at a lower cost. Appliperty, company and motor standard function types which issation and are being developed in Cobol 74. The order was for in competition with NCR. Cit. HB. Univac and IhM.

This would then act as checklist for those designing or evaluating query facilities.

A standard type which along query facilities.

A standard out, would fall outside the scope of this work. Users the scope of this work. Users the scope of this work of the scope of this work. alions include income, pro- will be to specify a rate

Miss for his financial year mided April 30, 1978, include princes of \$183 million and net will be supposed by the supposed for the supposed with source of \$148 million and net with source of \$148 million and her will be supposed to \$148 million and supposed with source of \$148 million and \$148 With Squres of \$146 million and station in the previous year.

Mater approval

why Fujitsu shauld bother ta develop its awn version of MVS. The reasan is that it is apparently illegal in Japan far a user to run an IBM operating system on a non-IBM mnchine Fujitsu's partner in the M-

risen sharply and now stands at

nimost exactly £1,000 million at

the current rate of exchange for

the Yen. The turnover of 387,400

allion Yen shows an 18.3% ail-

vanire over lust year's 327,969

million Yen. English recorded a

pre-tux profit of 13,500 million

Yen, down from 18,000 million

Yen last year, and representing n

mengre 3.5% of turnover. Fur the

current year, Injlisu is projac-ting further strong advance in

sales, hoking for 447,000 million

of the M-190, which is effectively series, Hitachi, has nat yet annonneed its own forthcoming supercomputer, which Is claimed to be even more powercessor having its near memory, ful thim the M-200, and will be rather than all memory being added to Ital's AS series as the common The M-200 is available AS/7, However, it appears that with up to four processors and a the Japanese trade and industry theoretical maximum maln ministry MITI has vetned the memory capacity of 64 mofficial name of M-210 that Megabytes However, Fujitsu Hitachi wanted for the machine. says that the capacity of the negisters limits this to a practical maximum of 32 Megabytes. Unundited figures from Fujilsu for the year to March 1978 Indicate that Inrnover has In maximum configuration,

alde in Furnog from Siemens, Is claimed to offer five times the power of an IBM 3033 unipro-Enjiourable says that its new large scale TISIV, EL operation system is "object and source-code compatible with programs written to run under HM's

the M-200, which will be uvall-

machine running under OSIV/ 14 without o compliation. The fact that fill uneraling systems are made available by

MVS, unplying that such pro-

grains can be transferred to a

Yen, on which it hopes in make 14,000 million Yen in pre-tax the company without testriction UK group to study online query languages

A NEW group has been farmed in the UK to study unline query tanguages The Chaliman, Rogor Tagg, nf Scienn, suys that there are aiready about 100 such languages available on various camputers, and with an standard syntex or style in existence.

here is an urgent need for a framework for future devalop-One alm uf the group's wark database and data analysis sys-

priscine form of dialogues, which

(H)VERNMENT computer cen-tive, particularly those involved in revenue collecting, would be prime targets in strike situa-

can in general be constructed later, far example by using macra facilities. The graup which has already

met twice, is tikely to affiliste to the BCS Information Retrieval specialist graup. The latter is predaminantly concerned with bibliographical systems, in contrast with the new group which will consider information retrieval more generally, including

The group has set itself the highlier of ublishing a repart during 1979. This will cover relevant aspects of the usercomputor interface and will also categorise the land uages currently available, distinguishing for example those which are syntax driven from those using prompt/response techniques.

'Prime targets in a strike'

mitroprotessur-based tions. This view was put forward tions. This view was put forward by a spokesman for the Civil and the Civ approval for linking to who refued a cumment on the who refued a cumment for the community of computers in central government that had been attributed to

the association (CW. June 8).

He said the CPSA egreed ip the main with the view put for the main with the view put tor-ward in the report. The use of selective strike action has been and will continue to be ane of the major effective means of applying pressure to the employer after negociations have broken down. The said

Infotech Training Courses



LIMITED

Carlos Carros

presented by Tom Gilb

☐ New Program and Data Design Technology 11-15 Sepiember, London

□ New Systems Design Technology

23-27 October: London

2-6 October, London

11-15 December, London

D Computerware Selection Methodology

For further information complete the form below and return to Infotech or call Liss Bentall on (0628) 35031 ...

:	Name	·
1	Name	
ı - '	Title	
ķ	Organization	
		:
i		
1		-

INTERNATIONAL

Telephone number...











How to specify all your project goals in measurable form

COMPUTER WEEKLY'S

NEW JOURNAL IS

TURNING OUT TO BE

A LOAD OF PULL.

LAUNCHED SEPTEMBER 1977-ALREADY AVERAGING

COMPUTER PRODUCTS

2500 ENQUIRIES AN ISSUE.

its launching, is itself big product news!

This big product-news journal, within six months of

Our latest issue received 3,500 enquiries and look

where they're coming from! A precision-plenned

while terms of circulation control have now been

engineers, most of them specifying equipment for

OEM manufacturers, the rest DP managers and Systems House exactitives with direct purchasing

power.

Each month Computer Products International publishes a special supplement covering a particular range of hardwere, in May, we're spotlighting Microprocessors, in June Teleprocessing Monitors, July Plotters and in September 8-bit Minicomputers.

But whatever computer product or service you're offering, an advertisement in CPI will give

For more facts, ring Display Ad. Manager Steve Measures on 01-261 8000 or direct line 01-261

you a lot of new pull.

8293.

readership comprising 16,000 key computer

executives in the U.K. and 24,000 in Europe . . .

extended to include 6,500 electronics design

party-goer senrching on a well-lit street. A passer-by starts to help him to find the watch he has lost. After half an hour, the passer-by asks: "Where exnctly did you lose the watch?" "In that dork alley to he left," says the party-goer. Exasperated, the passer-by demands: "Well, what are we wasting our time looking for it under this street lamp for?" Our Ilpsy friend replies, with frightening-logic: "Because it's lighter here!"

We computer apecialists seem, consistently, to apply the intoxleated logic of the party-goer to our projects. We set, as clear measurable goals, only those things vhich are almple and obvious to measure, like finished date. costs, speed and space.

important to the success n the project, like reliability maintainability, portability, ease of user learning and recoverability of files, for example, will typically be unspecified. Or at least the specifications will be so unelearly specified as to be

For example, o bank real tima project, where the hardware supplier was committed to writing 200 terminal subroutines, had this maintainability specification: "Our maintenance programmers ahall be able to maintain the programs." I would ask: If hey find a bug that's atopping the online system withir two weeka, la the system meeting the mointainability apecification?

Jerry Weinberg created the

which goes something like this: If you don't care about the reliability goal of a project, you can meet any other goal of the prnject. Which is another way of saving that if you dnn't care to measure whether the system works properly, you eon deliver It yesterday. If, howevar, you want it to work perfectly, your user may have to wait

forever.
In the real world, you and your user are going to have to reach a compromise. And that will require clear, quantitative and practically meaaurable definitions of the reliability concept.

I tend to think of a computer project as a boat with some random holes in it. Some holea are below the waterline. If we don't plug

them all, we risk sinking. If we nnly manage to plug most of them, we are going to have to do a lot of work getting rid of the water in the hont. If we plug holes above the water-line ("non-critical goals"), instead of the ones below, we may sink while we are plugging the wrnng "goala".

In my experience we are all guilty of plugging holes above the waterline, and stuffing pieces of bread into some of the critical holes. As an example of the latter, I'll bet that few readers ever define a measurable goal (not a technique which you hope will get you some result) for maintainability of programs. I'll bet that you have been stuffing breadcrumba into that hole (atructured programming, modularity,

comments, Indentation,



documentation).

At all computer installations I have visited I have never been shown ilotails of any post or present project, where oll critical goals are atated in quantifical and mea-

sarable form. I find this state of affnirs incredible. Data processing is management without objectives. In some arens of system quality we are in such a poor state that we don't even know a realistic level of on objective because we have never even meosured the

levels at previous projects. Enough of this criticiam. have been as guilty as ony-one. But I have tried to mend my ways. And I find great interest and ability among my clients and course participanta for the exercise of setting formal quantified goals for projects. It takes one to six hours of work to pin down eight to 16 gand

You might even do it for projects already under way out you should start naw to p**ractise** it for new projects How else can the manager

manage the project? We fill out o "metrics mntrix" as one culleague dubbed it. Along the vertical axis we list the dozen or so must critical high level gnuls. If you have more, you are probably listing tra-detalled gonls: this we ilu later hy "éxpluding" high level gunis ("security") Into mure deialled goala (file security, fire security, embezzlemen

Then along the horizontal oxis we fill out parameters describing our critical goals: measure In he used, planned quantitutive level, warst acceptulile case level, hist imaginolile cusa level printity, "more important than other gonl," and finully ; raference to the authority locumentation for einiming this goal ond its levels to be high priority.

Aa Lord Kelvin nnea said, li you can't quantify your knowledge, then it is of meagra and unsotlafactors kind. We find we can antis factorily quantify oil critical goal areas, and then use tham o design the systom. Try It PROGRAMMER NOTES

Advantages of a file handling library

component of programming that most people tend to use manufacturers routines. But n home-made file handling and record handling library can offer a namber of advantages, particolorly where the standard facilities are limited or neckward

Consequently Prngrammer Notes presents some ideas on a du-it-yourself 1/O library.

The routines should be written in assembler and stored in a senarate system library to be linked in with applications progruins at LOAD time.

The mutines likely to be used must often are those dealing with opening and closing files, Suggested formats are OPEN (unit number, file-name/ passward/owner-nocountnnme, location, access method new or nld, READ/WRITE privileges, expiry dute, status); the CLOSE routine parameters will be a subset of those with an additinnul retula or destroy parameter.

The file name may be supplied by ACL, by the user or operator in response to a program request, taken from a file, or even generated by the program. However supplied, the name will be in text format and needs

checking for illegal characters. Remember that the user's terminal or rard deck may be a valid file "name" default and should be allowed.

Passwords need similar volldation and any account numbers should be rhecked. This helps to see whether a user is trying to create a file in an account other than the one hols

Although breation of the file will default to primary disc sturage, users should be allowed to request a tupo or other secondary storage. The identifiers should be rhecked for hasic validity, and any operator messages printaced.

The access method parameter should allow for the file to be created as, or na existing one be used as - keyed, random or sequential. When a fila is to be read it may he possible to treat a keyed file as sequentlol. This means that when the OPEN or CLOSE request has been autlsfied hy the system, the file's access method type should be checked back with the initial

System performance aid in Shadow II update

ments to Altergo's Shadow II TP monitor include two major new facilities developed by the com-pany in the US. Energetic mar-keling in North America, in-cluding the opening of alchecluding the opening of alght regional offices earlier this year. has already given the product around 70 US users.

One of the new facilities is a tool for predicting online system performance. Based on a model of the proposed system, the

ruzzier

for the double journey. How many miles does he walk? See page 45 for solution.

such parameters as resource utilisation and response time.

The other facility, Online Mapping, aiready has some 20 users in the US. Based on a special man file, which stores man desirations, the subsystam is claimed to result in an average 30 per cent saving in overall programming and testing time for IP applications.

Fully intersetive, Online Mapping climinates the need to compile map definition programs, and checks for incorrect specifications, flagging the cr-

TRY this one in your ligad. A The system enables an climber walks up a mountain peristing map to be recalled to along ab 1% toph, and down again the screen, from where tream be at 4% toph, taking six hours in all reasily modified or used on the forman. A basis for creating a new map. A chargeable option, Online Mapping costs £2,400

EDITED BY PETER HEWITT

Basic Timesharing reveals details of access protection feature

two system software parhages and an able for updating all linked files online accounting system for Basic automatically when a trunsaction is Threshiring's BTI door machines are entered being marketed in the UK by Cara The system hundles a comprehensive Consulting. At the same time, Itasic range of functions including general Timesharing has revealed a unique proprictary arctional fracture which protects lostelled yearlor's software from un-

Cora's Midas system, developed in the USBy DLM Enterprises, is an integrated Offered in the US largely through accounting and inventory control bureaux, the system has about 70 US package. Based on a network of direct users access chained likes, the system is not - Cara's other two offerings, also deve-

ledger, urder entry, bill of materials, job cessing is performed, except for example such functions as producing

statements.

loped in the US, to some extent overlap method. It is designed for use by end-

Minds, a database manager and level command language and searching and sorting facilities. Like IBM's Brads (Software File, June 15) the system includes a data dictionary controlling application program access to files.

The other application development tool, Mars (Multiple Access Retrieval source code. software without allowing access to the

In their capabilities and are sold there in users as well as application program-

Real time

monitor

VS1 end MVS operating systems is the letest Value Con

puting product to be released in the UK by RTZ Computer Ser-

SMT (Systems Menagem

playe of recourse utilisation permitting systems program

Tool) provides rest-time dis-

creating files and also updating and report generator, incorporates a high retrieving stored data. Both packages provide for multiple concorrent access Said to he unique, the proprietary account feature on the BTI 4000 allows software suppliers to lieeuce the use of

System) provides file handling facilities
The protection is provided by the based on an indexed sequential access account structure of the operating sys-

cannot be accessed without supplying a high-level password, which is held be the operating system software.

The technique is leasible because Basic Timesharing permits only very estricted access to its system software. forbidding examination of the operating

system either in core or on disc An interesting aspect of the facility is that it still permits the software vendor dial-up access to the system, so that he can maintain and update the package

Portability key to NAG for minis

tion lust year fur the Prime 30tt (Software File, August 18, 1977) the Numerical Algorithms Group Furtran library has now been made available on several

further minicomputers. Perhaps of most interest will be versluns for two Digital Egylpment machines: the Php. Il range and the new VAX-II 780. Also offered are implemenlations on Harris equipment and the Rank Xerox 53tt.

Yet in be completed last cutrently under validation, are versions for Glat 4070 and Just hardware, the ModComp IV. Nord 10 and 50 systems, and implementation for the Cray I super computer. Dr Brian Ford, the director of

the Group, printed out that the remarkable portability of the software was in part due to the use of a carefully selected subset of ANSI Fortrain. Also significant was the isoln-

tion, in the source code, of explicit parameters defining essential numerical features of the machine.

These strategies had enabled NAG to avoid the major rewriting of software found libraries, he mated.

rocessary to other numercial The team but heen partica-

Time sharing system that Offers 'TSO for OS/VS1'

A TIME shacing system ite; scribed as an implementation of TSO for OS. VSI has been adopted for macketing by The European Software Company (Software Life, tione 5) The extem Tone 3, was developed by Tone Software Corp of Augbeim, California and roos on IBM 370) 1355 and upwards

Tone-3 is ni general functorfally equivalent to Trift affering similar facilities for interactive program development as well as supporting systems programing and operations activities is leminol comidand language and command procussors are TSO compatible

An interesting architectural

clantination of oser swopping. In TSO, (which is available only maler OS, MVT, SVS, and MVS) toposes swapping on pugling, resulting in a somewhat greater overhead.

Another factor claimed to improve throughput is the use of BTAM rather than TCAM.

The storage requirements if the system depend on the number of active partitions. According to the company, hetween 10 and 15 users could typically las supported by it ona Megabyte partition when running in full virtual made. Tone-3 will be available in the UK for about £600 per month.

Come to one supplies for all your terminal

requirements and take advantage of our wide

lange and discount offerture. Buy or rebt

Sparen telairs service or citaul returbishing.

TE)

Telegrariter Eduipment Ltd. Ateman Street Trong, Herrs, HP23 HAJ Trong (044 282) 4011

and valldotion of the library generolly took around three man-months, but transfer to the VAX had been completed in only

mers and those responsible for production to fine-lune the sys one man-month. tem. A unique serty-warning mechantem is elso provided, that notifies the user of pending Despite the concurrence of new hardware, a new operating system, and a new Fortron comjob time-outs and atlows the times to be reset. SMT is pricod et £2,800. iller, all 345 library routines had heen implemented on VAX virtually without ony difficulty.

sation; and the generation of

that for two-dimensional error

Revision 3 of Ansys, tha

popular finite element analysis

chidling element hundling, non-

ysis capubilities, inpat, antput

Systems Professional, also

konwn as Sys Pro, is a library of software developed in the US to

meet the needs of a company in

the areas of structural anolyals

and graphics processing.

ystem, enhances areas in-

contiurs.

LUCS library updates

RECENT midlitinns in LUCS' software library include a program for optimising inicrowave circuit designs, on upgraded version of Ansys, and a set of 30 US programs for atructural engineers. All are affered as part of the bureau'a interactive service.

Designed in analyse the performance of complex high frequency rent TPS versions, as mony of

circultry, Compact feotures a built-in databonk describing the exiating functions abouid be a VME/K bureau service. widely-used devices. The progroup has live main functions: circuit and stability analysis: sensitivity and mudysis; optlmi-

VME interest with order WITH an order for an ICL 2950 handled by the operating ays system, Telecomputing has con- tem, said the company.

Telecomputing confirms

firmed its commitment to develop TP software for VME/K and VME/B users. The new system will be used initially for the development of TPS Care under

VME/K (CW, October 6, 1977). The primary aim of TPS Care is to ensure that existing TPS users enjoy complete software portability from 1900, 2903, and 2904 systems to tha 2900 environment.

In support of this goal, the company has set three apecific objectives: to preaent an un-changed user terminal interface; to provide the same user programming interface; and to provide additional code in any areas where the atandard operating system falls short of current TPS

TPS Care will inevitably be a higher level product than cur-

One of the first tasks on the

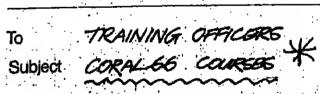
new machine will be to validate the basic transaction processing facilities in VME/K, schedule to appear in version KSV-16 of the operating system next

This release should coincida with the delivery of the 2950 to Telecomputing's Oxford headquorters, olso planned for March, 1979.

First deliveries of TPS Care for VME/K are expected around autumn 1979 and will be followed by a version for use with VME/B. A common TP Interface has been promised by ICL for the two operating systems,

notes the company. In addition to eatering for the development of TPS Care, which

MEMO



The next Systems Designers CORAL 66 training course is on

* 7th August 1978 Famborough, Hards. Cost £190. One week intensive course produces effective

CORN programmers through the use of proten, worked examples. course organisars are premier suppliers of CORAL 66 compilers to industry.

Details from Tony Golbour Systems Designers Limited

Systems House, 57-61 High Street, Frimley. Surray Telephone Camborley (0276) 63471.

duled for release in October.
Included in the package are a report writer and a sort/merge routine. Written in a propriation and language, the compiler runs in 28K partition, generating code executable under the RPS operating system.

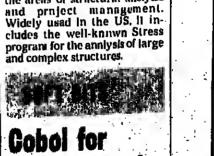
HALF-YEAR turnover of 5405,000 has been achieved by Systemsolva (Compiler Sarvices), representing a growth of 60 per cent over the same period last year. The company recently won a second contract to imple-

program for the annlysis of large and complex structures.

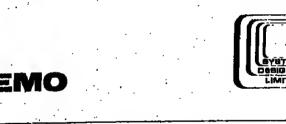
Cobol for

the software was developed by Royal international Systems, of Tustin, California and is scheduled for release in October.

won a second contract to impute ment a pension fund system, this time for the 50,000 members of the Port Employers and Registered Dock Workers scheme. That system will be run on an ICL System 10.



A SECOND Cohol compiler has been produced in the US for 18M's Series 1 Clumed to meet full Level 2 ANSI 1974 standards,











The reason for this is that if a job's priorlty i

set beneath the system default, all subsequen

work will immediately he processed hefore it

leaving the job concerned on the input queue for

The resetting of work via the console is

scorned at some installations where it is argued

that the work has olready been scheduled in order to get the best 'mix'. But the practice is

an excessive length of time.

BIDS are now being evaluated by the Post Office for the manufacture of modems for use on the 9600 bps Datel service which it is planned to introduce

Contracts for the modems are expected to be placed in about September this year.

Maanwhile a atop-gap 4,800 bps service is operating in the City of London, where 50% of the data transmission handled by the Post Office is centred. Called Datei 4832 it is based on the Racal-Milgo MPS 48 modem and will operate until early next year when the full 4800 bps ser-vice based on the Post Office's Modem II is scheduled to begin.

This will be enhanced in mid-1979 by a furthar model of Modem II which will support muitl-drop lines.

Tha Poat Office'a X25 data network is expected to be in service in 1979 or 1980, all hough It has not yet had formal appro-

essential to anyona connacted with dp manage.

To subscribe, simply complete and return the order Recin 208, Dorast House, Stanford Street, London SE1 9LU.

Midland users consider setting up standby installation users in the Paris areo. When not running rival, has also spoken at a Mug meeting. BL Cars, which is now concentrating

specifically for providing IBM stamiby Midland Users Group, Milg, an associa- stundby centre is currently being dis- grain development. tion of blg IBM users in the Birmingham cussed by himself and his counterparts area.

Dunlop, Pirelli, Tube Investments, Lucas Renault and several other major IBM

John Leighfield, systems director of BL work for Milg members whose systems facilities is being considered by the Cars, told Computer Weekly that the had gone down it could be used for pro-

Mug sees itself as a high level pressure group and is taken seriously by IBM. The centre would be funded jointly by Mug members which include BL Cars.

from the other Mug member companies. group and is taken seriously by IBN whose UK boss, Eddle Nixon, has alread be similar to one set up in France by addressed one of the group's meetings. whose UK boss, Eddle Nixon, has already Gene Amduhl, the boss of IBM's arch

most of its mainframe processing power at its Redditch cars data centre, already has mound agreements with Lucas and Pirelli to provide standby facilities. Last Christmas Bl. Curs made use of IBM's bureau centre at Warwick, after one of its 370/158s at Longbyldge went down



Key informetion obout an organisation's telephone treffic, like meuthorised overseos cells, can be printed out as e call is mode on this erminal. It forms part of the Raol Time Genemtor peckage introducer accounting system. Each time could be made Tiger reception on the extension number, the number diolled, the time the call sterted and tha time of completion. If not wented immediately this information is recorded on magnetic tape for analysis letsr on a maintrams computer. Existing Tigar users include Rank Xerox, British Steel, Rango Vickers, Beachams, Ford Motor Co end Honeywell.

Leyland threat to **IBM** at Warwick

the centre opened by BL (formerly Leyland) Curs at nearby Redultch (CW, June 22). Chris Chiles, group DP manager of BL Cars, told Computer Weekly that the dato processing capacity of the Reddich centre would be expanded by about 30 per cent a year over the next few years and that the intention was tose bureau aervices to completely separate outside organisations.

This would be in addition to These services already include the processing already being carried out for more than 30 BL Cars sites all over the UK.

Although BL Cars does not actively market bureau services nt the moment it already carries out some processing for nonrelated componles on a limited scale and ulso provides a number of services for about 300 diatributors of BL Cors.

data

processing

aupplying distributors with bin price liata and early next year BL Cara will introduce a botch stock control service. Diatributors using this will be equipped with IBM 3741 key-to-diskette data collection stations.

Future developments could hiclude offering services to dis-Irlbutors of the other munufacturera' cars ond this would put the Redditch centre in direct competition with bureaux ulready in this business.

By the end of this year the Redditch centre will have two 370/145s, two 370/158s and a 3033, but Chiles said that the 158s would be replaced next year by a 3033 or hy an Amilahl machine. This could by un Amdahl 470 V/7, the biggest machine that Amduhl hitilds and the most powerful general purpose computer currently nvall-

Study of word processing

JOINT team from the Civil Sorvice and the Office Muchinery Sector Working Party of Neddy Is In make n foct-finding trip in the IIS this

A range of matallallans will be atudied in the US government and in private companies, both successes and fallures, to glean information to aid the develop ment of the UK word processing

Three ropresentatives from the Sector Working Porty will be on the team, with one ench rom the management services division of the Civil Servica Department, the Central Computer Agency, and the Stationery

The team feela there la a lot for t to learn in the US, where the word processing markel la more developed than in the UK.

NEWS IN BRIEF

DEC's family of terminals

INTELLIGENT data copture is the main application area for the PDT-11 family of programmsble display terminals introduced by Digital Equipment. The three members of the family, the PDT-11/110, 11/130 and 11/150 all incorporate DEC's LSI-II interacompoter, which is com putlile with DEC's PDP-11 minicomputers.

All three terminals are built around a new video terminal. the VIIIO, which con display 132-column lines. In addition, the 11/13ll hus two cartridge Inpedrives while the 11/150 hos floppy disc storage. There is also provisiun for a local printer.

Unline system

TWO Prime 300 computers have heen ordered by the Building Research Establishment, 8 government-funded body which carries out research into the construction industry. The first will be used by the Establishment's library and the Building Research Advisory Service for online information retrieval of the Establishment's reports, and the other will be used for comnutur graphles.

CAM seminar

ANOTHER two-day seminar on the prublems of interconnecting logic devices is to be held by CAM Consultants on July 10 and 11. Subjects to ho cuvered at the St Albans vonue include cross talk, puwer supply decoupling and signal termination and drive techniques. Further information on the seminor can be obtained from CAM at 17 King Harry Lane, St Alhans, Herts AL3 4AS.

Liveware File by Don

NTW TRIUMPE AND DISASTER THO IMPOSTORS JUST THE SAME





OP SPOT

By Bernard Allen

'Most managers don't have a clue'

hecame involved in training

them informally as well as car-

rying call the function for which

get acquainted with the system,

were on a higher grade than l."

he was pald — operating.

given little consideration.

obvious I had no chance."

his hard-wim skills for granted.

Of the DP manager, he said:

"As far as I can make out, the DP

manager is a nice persun, but it

the handware, suftware, or the

manner in which the computer

Talking of the operations

manager, he sald: "At first I

thought he was someone to be

trusted hut at the lust stuff

oppraisal he told me that I was

appraised in the salary scale in

long really well and would be

ment is organised."

subvious that he has no iden of

use of, but the furt is rarely recognised - with the result that the staff do not get their just reward in terms of pay and

The great profilem is that senfar management seems to be incapable of differentiating herween operators who are competent technicalty, and those hoore not.

This is the opinion of a senior operator who contacted me in response to an Op Spot of a few weeks agu, which reported on the DPMA meeting concerning the relotionship between operations stoff and DI management,

He told me "I started in operations with a company hich provided me with an excellent grounding in committing. They sent me on a series of courses and also arranged for a lot of 'hands-on' training to be carried out at the site."

He stayed with the company for about two years, but left because he worked "an odd shift system" and he wanted something less tiring.

He continued, "I went along loan agency and they told me of a company which was in the process of converting from It't. kit to that op which I was troined, IItM. Subsequently I went along for an interview and got the position of senter squera-

Apparently none of the aperations staff had relevant the near fature. However, by

is in old operators' most to a mi it

for testing work. It you than't try

lo enforce installation standards they will gub kty be typored

That is the view of link

and writes in cospenses to an I by

Spot no operations documenta-ilon (CW, May IA).

He continues: "Surely all ex-

erioneed operators know that

tatry to guess what o program-

merreally meant is a sure way to

waste hours of machine time

Saya Stavensun, "Unfortun-

tiely your example is not a good

one as it concerns testing work

Documentation for testing is

never a great problem because it is not needed in ony great depth

All that is required is a well-

esigned run sheel and some

The real documentation pro-

den is with live work, which will still be running after the

intallation rules about testing

and overwrite files."

Don't try to guess what

the programmer meant thewcharts and sample print

is still largely true, particularly loyouts, etc is required. "The main problem is actually fore the documentation lemethod that works fairly well is to draw mp a the allest distinctly set of operating instructions and Stevenson, who has some 19 years' operations experience. ruculate copies as a standard."

> Sievenson makes some intiresting comments, but his micisio of the example I gave la

(in the accasion described, a programmer used the job stream dedicated to lesting work to Submit a library compression juh he the system. The job sonn exceeded the time allocated to testing work at that site with the result that the aperaint, in accordance with the instollation standards, cancelled it.

The point I was trying in make was that if the jnb had been accompanied by documentation which included data as to its function, the operator could have let it run to tis conclusion. and programmer have He could then have contacted This is when the extra informs.

sent to the DP manager and il contained such comments as

"I did much to help the staff at the site, he believes that the time has come for the and that included those who implementation of some means of measuring the knowledge of Alter he had been at the site operations staff

for about a year, one of the operations stuff left the company and the position of shift leader became vacant. He applied for the job, but was "Sn much for all that training comment on it.

of staff," he said ruefully, adding "Also we must have some-"I had an interview for the job, thing which will give a true inwith the operations manager dication of an operator's knowand the DP manager, and it was ledge and be accepted as such by DP managers. At present the He blames the DP manager majority of them haven't a clue and the uperations manager for about what goes on in the computer room."

"Staff appraisals should be

As a result of his experiences

carried out on a regular basis and the operator concerned should be shown the report made out by the operations manager and allowed to make a

fulling to appreciate his technical competence, and for taking

"Lazy, not interested in the work and unimoginative,"

resets jobs to priorities which are higher than the system default. This is achieved by use of the following OS RESET command: Barclays relocation unpopular

THE Intentions of Barclaya Bank for two of its London computer centrea do not agem to coincide with the career plana of a considerable number of its opersilons at aff.

HINT OF THE WEEK

in the IBM OS/VS environment.

THIS week's hint relates in the reaciting of jobs

In order to make the best practical use of the

system resources, and so ald throughput, the

console operator should be constantly aware of

the facility which is svallable to reset job

However, when rescheduling work in this

manner, the operator should ensure that he

By the middle of next year, the bank'a sites at Harrow Road, Harlesden, and in the Tottenham Court Road will have been relocated to a new centre in-Gloucester According to members of Barclays ataff, there has been a

proposed move was announced last October. The figure is said to

Beware when resetting job priority

be about three a month. The bank has offered a

number of benefits to ataff who are prepared to make the move to Gloucester. These include a 21/2% mortgage for persons of 21 years and over.

Operators often complain that naturally listens to their point of visw. Well, Op Spot is listening and Bernerd Allen would like to henr your pinions and ideas on eli metters relating to computer operation Your istters should be sent to Op Spot, Computer Weekly, Dorsat Houss, Stemford Street, London SE1 SLU. Telephone calls ors equelly welcome end gernerd cen be contacted directly on 01-261 9035.

Nabisco wanted distributed processing not distributed problems -so they ordered the Nixdorf 8820 A company lika Nabisco does

Whon you are one of the world's largest find manufacturers and you are planning to expand your vitollyimportant arder processing and stock cuntral system, you cannut afford problems:

Tuke Nabisen - famoua for Shreided Wheat. They wanted to further apphisticate thair computing facilities by establishing an integrated communications nelwork, with autodial at the mastar station and automalle answar at the remote sitas. Their depot staff were not computer-trained

personnel. They knaw the sort of problems that arise in such distributed networks.

Problams like:

"We had a powar fallure and all our data was lost." - "Sonteona has removed a diskette with files left. open." - "We have very little office spaca available." - "We do not want lo learn another, non-standard language." - "Can we overlop input/ output operations?" - "We may need up to 60K of mamory." - "Our people have never used a computer.

The Nixdorf Computer 8820 Terminal

not venture into a project like this with eyas abut. Thay looked at a number of terminal systems and only one manufacturar had a machine that could provide a satisfactory solution to all those problems and more

Nixdorf is the manufacturer and the machine is the Nixdorf 8820 d intelligent terminal.

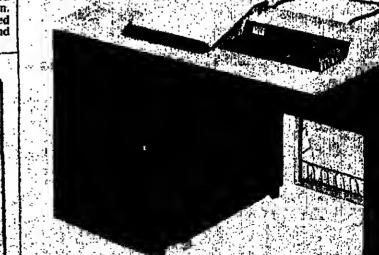
So Nabisco purchased 10 Nixdorf 8820s and the entire system went live at all depole on April 1st. They are now looking to develop the system sill further.



.. 8820 and the Nabisco network, telephone Roger Cordrey on 01-572 311

NIXDORF COMPUTER

Nixdorf Computer Ltd., Hounslow Centre Lampton Road, Hounslow, Middlesex,



Tape Library Controller £125,000

What's the cost of gerting in a muddle with your mag-table tapes and disks. The very thought prevents rational animates. Buy yourself some insurance by sending your literary staff on inforech Operations training—the course for them bosts only £145.

call John Blake for details: 0628 35031

Moteon Operations Ltd.

HAVE YOU papers hes written an exclusive major erticle for DATA PROCESSING, entitled "The new generation of triput (actnalagy," in which he demonstrates how date processing itself carriellminate encoding forms and repetitive verification. Computer output microtilm: Your organisation could probably. seve over 98 per cent of the offics space devoted to fitting — simply by using microfilm. You would also been document retrieval and else copying costs. Coinciding with Microforum Europe, we, from Bell & Howell and sear copying costs. Coinciding with Microlorum Europe, we, review the letest products.

Do-It-yourself: Availability: vereatifity and chaapness of the microprocessor are instrumental in a continuing 50-per-cent-blue sinust growth rate in the office, and home, dp-It-yourself computer field. An expert provides pointers to getting started; and we see what lites are on the market.

Just three of the vital features in the June DATA

PROCESSING. Just three of the vital features in the June DATA PROCESSING.
Add to this magnetic discs and tapes with a special section on lioppies, two Linusus cass histories; a special report on the tCL users' convention; dages of producte; a roundup of the latest riews in convenient form; our regular features on micro-processing and lirst time users—and you begin to understand why DATA PROCESSING; is such assential landing for do managonia, chief accounts. Data Processing Subscription Order Form Plaase enter my subscription to essential trading for dp managora, chief account-ants management services directors, and corpo-CHEQUES / P.O. SHOULD BE MADE PAYABLE TO IPC BUSINESS PRESELTO rste management.
All this, and much mare, is pseked jitto line June Can you afford nat to subjective to DATA PRO-CESSING? It cests just £15 e year (oversess £18) for 10-issues, al) just as full of paticles and information

some new products were being

demonstrated, most of the com-

exhibiting in their roles as

agents or distributors for UK

What was new from European

sources, however, was of con-

siderable interest. Two new de-

velopments, one from

Nowegian-based Myeron, and

the other from Data Applica-

tions International in Brussels,

use the new Advanced Micro

Devices 9511 floating point

maths chip. This device offers 16 and 32-bit floating point maths

with hardware aild, subtract,

multiply and divide, together

with a wide range of complex

ability to interface with a

standard 8-bit ilata bus

athematical functions, and the

Myeron uses 9511 as an option

on ita new DIM 1003, Z-80A

based CPH card, one of three

new cards being added for use in

the Myera-I microcomputer

The card features 4K hytes of

and IIS manufacturers.

Edited by Martin Banks

A high standard from London N of Thames

in the bright sunahine as the competitors toiled in the heat, at the London, North of Thamea licat of Computastars held at the Willesden Stadium last week. A record entry this one, with

some 31 men's and 12 ladies' teams taking part in a whole range of avents in the hope of qualifying for the final. The day was concluded with o series of gruelling steeplechase

races, and at the end of it all Patrick Kamara, an operator with the Midland Bank, and Gayle May of Case, emerged as the Computastars of the aren. Patrick is a natural athlete, as

found out when I finally



amile of victory for Jayne Wheelsrhouse (above), a tepe librarien at BOC Datasolve, after her win in the lodies' jump-ups. (Below), Computations of Tomor-row — enthusiastic participation in

Apparently not vary tired, he

"The sleeplechaaa was tha hardest, coming at the end of the day, but I didn't find the other events too tiring. I don't do much sport, although I play football occasionally.

Unfortunotely t was unable to find Gayle when the competition finished, but having seen her romp home in the sprints, I feel sure that she didn't even stop at the end of the sleaplechase and ran all the way home!

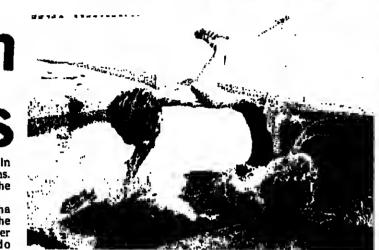
The men's leam competition was won by the team from Gordon and Gotch with '14i points, with London Transport on 1324 points in accord place. The feath from EMI won the men's plate.

In the ladies competition, Allied Suppliers were top with 80% points and the team from Case finished in the runners-up spot with 7614 points.

Some of the athletea who took part in the heal appeared to bo of a high stondard. A fact confirmed by Gordon Calrns, of John Goldsmith Computer Services, who said, "Some of the leams have been training quite hard for the heats, and the attitudo neema to ba gotting more aerious as the competition

Obviously aatlsfied with the way the day went, Cairns added, We have learnt a lot since the first couple of meetings, and today we kept things moving so that the competitors didn't have to wait about too long between

"In the press-upa event, for example, each person goes on until he reaches his limit as opposed to a set time, and in the penalty kicks, we now use both



Final heat

Stadium, Perry Perk, Alminghem

on Sunday, July 9, beginning at

The final of the competition

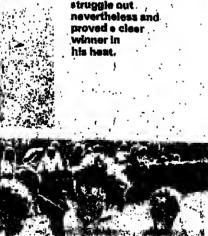
skee place at the Crystal Poleoe

Sports Stadium on Septembar 30.





The water lumn defeated most competitors in the teeplechese, including (ebove and left) Peter Cheatle of Allied struggle out. proved e cleer winner in





Girl Technician of the Year Award

AN onnual award to the Girl Tech-COMPUTASTARS is organised by nician of the Year is to be unde John Goldsmith Computer Sarvices end supported by Computer demorial Trust and the Institution Weekly.
The lost regions keat will be for teams from the Midlends and will Electrical and Electronic Tech nician Engineers. The amount of the award is to be £250, with no condibe staged at the Alexander Sports

tions as to how it is to be spent.

The sim of the sward is tu draw attention to electrical and electronic ongineering as a career for women. The winner will be a girl who has not

only undergona technical training but has alrown that also can hold down a responsible job.

The closing date for nominations is October 1. Further details can be had from Joan Ashton, IEETE, 2 Sovoy Hill, London WC2R OBS. Tel: 01-836 3357.

David Radhouse, previously a management consultant with Harri-son Computer Services, has been sppointed to the board.

Tony Golborn of Systems De-aigners Ltd has moved into sales, as sales executive from the software group in which he was a

Alac Meraden, distribution con-sultant at British Road Services, has peen appointed group consultancy manager, which includes functions such as days looment and application f computer techniques to transport

Peler Easton and David Morion have been appointed associate directors of CMG (City of London). Both were previously ompluyed by CMG, Easton as senior systems and programming consultant, and Morton as project leader of the Payfact

Pamela Goodmen of VIP Consult-ents International, previously houd of edministratiun, has been pointed chief executive and senior sociate with total responsibility for the overall operation of the busi-

Poul Melhven has rainined RTZ Computer Services, where until 1977 he was cummercial systems ager and technical manager for tho Value systems, us systems doveopinent manager. In the Intervening oriod he has been DP manager while

Wallace Avary has been appointed area managar, hank operathous in NCR's finance and government divi-sion. He was proviously a district nanager in bank operations.

Chris McCarthy, senior soles executive with Care Onta Processing in Ireland, has been promoted to head of sales, computer sales divi-

Raj Prasad has joined Systemative as a consultant in the Northern ice, from Gemini where he was a senior programmer. Dovid Sanda, previously a project leader with the University of London, becomes a consultant in Sunbury-on-Thames with Systemsolva, and Michael Rigby joins the company as a senior analyst/programmer from John

John Morgan has Joined J. M. Factors as paper products managar, from Wiggins Teape where he was technical adviser to the IDEM marteling department.

Tony Crossley, previously print area manager with ICL, has joined jointly by the Carullue Haslett Software Schooles Comprile as mor-

> Thomas Howard has joined the data products group of Hel in the US as vice-president, finance. Previously he was assistant corporate controller of Fairchild Comers and Instrainent Corp.

Jim Kane, general monager of Computer People Contracts, a VLI company, has been appointed journaging director. Mika Singleton hua juined the company as sales executive in the Home Countles, frum DEC where he was senior counmercial accounts raprosen-tative. Roger Smith, previously a sales executive with Gestetner, has joined Computer People Contracts, us a sales executive in the South-

Pat O'Donoghua of Cera Date Processing in Ireland, has been pro-moted from senior soles executive to head of sales, bureau sales division.

Stuart Ramsden becomes systems support manager for Redifan Com-puters' Northern brunch, Previously he was supervisor, field operations in the company's technical information arganisation. Dean Webster, previously a systems unalyst for central accounts with Redifon, becomes systems support monager for the flumpelal branch of central accounts.



Jackson to board

CUSTOMER services manager of Computer Technulogy t.td. Jim Jackson has been appointed to the board. It is the first time that a divisional manager has been mada a director within C'It...

Jackson joined the support de partment of CTL in 1971, and becama successively hardware suppor manager, product davalapment manager and UK service manager. In 1977 the customer services division was formed from hardware and software support training and installation planning, and he was

appointed its manager.

Symposium of database reachers in UK universilies; polyiechnics and colleges of technology, Dapt of Computing Science, University of Aberdsen, Aberdsen, 9.30, Details; Dr S. M. Deen, 0224 40241, CX1 8421

6421. JULY 6-7

Programming group macting 19M Computer Users Association, Holiday in, Liverpool, 19LY 18-14 Current problems and methods in partial differential equations (Fourth Summer School), Liverpool, and Manchesier Universities, Dopartment of Mathomatics, University of Manchesier, 19LY 12 Mostine, CAC, House, 19

McSting: CMC Users' Association. (CUMAC). Norfolk County Council, Nor-wich. 1020. Dotalis; Makienhaad 28525. JULY 18-28 Artificial Intelligence; conference, Alabi Gl. Hamburg. Details Derek Stag-man, Leeds 31751. ext 7264.

AUX 18-48
Local stithorities group musting IBM
Computer Union Association. INLOGOV.
Birmingham University
ILL Value
Spellarin Group meeting. ICL Data
Edity Users Group, HSV-1.td. Bastag.
acks. 11.00.

Compours, communications and tech-nology transfer, Jerusalem conference 80 information Technology, Information Processing Association of Israel/IEEE. Jerusalem.

Operational data security workshop.
Operational Data Security Corp. City
University, London ECI. Register August
18: 01-255 (399, ext. 347. AUGUST SI 24

AUGUST 21-28

Cybernetics and systems fourth interestional congress. World Organisation of Gangral Systems and Cybernetics.

Ameterdam Details: Dr J. Rose, College of Technology, Stackburn, 1et 0244 64321.

ALGUST 22-25.
Conference on parallel processing-ISPE Computer Society/Wayne State. University, Editing, Highligan, USA.

AUGUST 28-25
Signs of 78. This conference on com-puter graphics and lateractive techni-ques. Association for Computing Machinery, Asiaota, Georgia, USA.

AUGUST'S SEPTEMBER ! Eighth Australian Computer Can-derence, Australian Computer Society. Camberra.

at Geneva exhibition on show at the International troller cards called RCS - the Microcomputers, Minicom-"Real-World" Control System, puters and Microprocessurs and five versions have been produced to meet a variety of appli-Exhibition and Conference held at the Palais des Exposition in Geneva last week. Although

They are all based tu soma degree on the first version, tha RCS-K kernel module. This uses ponles taking part were an Intel 8085A microprocessor together with the AMD 9511 for scientific floating point matha functions. The kernel features between 4K and 8K byles of PROM space, between 1 and 4K bytes of RAM space, five external vectored interrupts, optoisolated serial I/O interfoce with programmable baud rates, and an on-board power supply to run from 24 vults. The other four versions that

make up the family of carda ore the RCS-GCM general control module, the RCS-ACM automation control module, the RCS-PIt: position and temperoture controller and the RCS-ICM Instrument control module.

Following the "real world" theme, the ennipuny is also shortly to launch a new "Real World" Baste interpreter. Intended for the same princess and ndustrial control applications fur which many simple Basic interpreters have been written, the DAI version is said to include Input/output and Interrupt functions, which the company claims are not avultable on other simple Basics.

development system that is cap-

able of operating with some 30

it is in fact a software package

that can be run on may DEC System 10 or System 20, PDP-11

ur Data General enmputer sys

iem. According to BSO pre-

In addition to the complete

debuggers, as separate items.

different micrus

static RAM, 12K hytes of EPROM. (W) asynchronous: synchronous inleffaces for hundling multiprotocol communications such as HDLC, SDLC and HM The problems of developing BiSync, unil two bi-illrectional microcomputer systems using a variety of different micruperallel ports in which earli has that data lines and two bounds and a coptional AMII processors was demonstrated at the exhibition by a US company, 9511 is used to provide a 24-hit Boston Systems Office Inc, cur-rently looking for a UK ogent. hardware fluating point maths BSD movided information on a The tillier two cards from recently introduced multi-user,

Mycron ure the DIM 1035 disc untilti murriquocessur software controller, and the DIM 11102 communications processor.

The disc controller can perate with hard disc systems up to 50M hytes, and in the company's own systems configurations, it is generally used Alth either Perce or CHC disc driver. The card has 24 1/10 lines available, and with un 8-trit processor based no two 290t hit slices offering a 200 nanusecond instruction cycle time, is also capable of being used for frontend processing tasks.

The communications procesfor can be used cliner as part of a Mycro I system or in stand. Jone mode. Based un the ZKOA. features IGK bytes of dynamic RAM 2K bytes of EPROM and led serial "asynchrunous/. wachronous interfaces for han-ding HDLC, SDLC and IBM Sync communications proto- existing microcomputer devecole. Baud rates are from 50 to kepment systems, BSO can also

Data Applications Internation in enable the user is down and up line load to and down and up line load to and

\$3.5bn 'personal' growth APERSONAL computer market will have risen to 1.2 millian word; \$3.5 billion by 1682 is one computers.

To make up this massive Pediction to emerge from the growth, the analysis predicts that the major markets will be Actording to an analysis of that the major manner found in the home programmer for Further equipment developed to help turs. Further equipment deve-hipments will be needed to help Market research firm, Creative Stategies international, ship lipments will be areasible, and make this growth possible, and make this growth possible this this property of the possible this property of the property of the possible this property of the property of the property of the possible this property of the possible this property of the property of the



Smell computer systems are now gaining the interest of some of the world's largest companies, and the Consumer Products Division of ITT hee taken on board the Appla II machine to sell so its own ITT Computer. Seen hare in a business anvironment, the system had its first public demonstration at WHILE the National Enterprise Board's plan for a UK semicon IMMM in Geneva lect week.

from the development system's In-circuit emulator.

A system that created a consideroble amount of interest at the alrow was the new Rockwall AIM-65 advanced Interface nodulc, which was getting its first Eumpean public showing. The module, on the stand of Rockwell's Swiss agents, Amnonn and Co AG, is a lowcust system intended as a "first entry" intu microcomputing.

Based on Rockwell's version of the MOS Technology 6502 microproceasor used in the Commodore Pcl and Kim-l sys tems, AIM 65 is a fully assembled "complete" system fenturing a full gwerty keyhnard, a 20rolumn thermal printer, a 16character display and Inletypewriter and midin cass-ette interfaces.

Current prices being quoted for the system in the US are \$375 fur the IK byte RAM vorsion und \$450 for the 4K bylo RAM version. The system has a builtin expunsion capability for but peripheral add-ons and a full system bus, and hith ore comattlble with the Kini-I System it will bu uvailable in the UK through Rockwell'a agant

iran sets up

ductor company is in its infancy, the Iranian government has setablished its own company, Electronic Component Indust-ries with on initial invostment of 15.5 million. Initially ECI will confine itself

to encapsulation, and hee spans \$1.4 million on tasters from Teradyne, and \$900,000 on enres Corp.

Encapsulation to due to begin in August

DIY show reflects growing interest in 'personal' market SCMP processor. systems continued last wack at London's West Cantre Hotel. where the DIY Computer Show

was held. Although originally intended as a showcase purely for the DIY enthusiast, the axhibition had been spread to covar tha amall business systema

The DIYer was not without some things to see, however. On the Bywood stand for example. the company was not only showing Ita exiating Scrumpi Microcomputar, but was also talking about the next development, the first prototypea of which are expected to be reudy in about two months. Known as Scrumpi 4, it will be

a single board microcomputer klt with an expected retail price of under £150. It is one of the first announced applications for National Semiconductor's 32K bit ROM holding the 4K byte National Industrial Basic Language, and the board will also feature a socket for Natlonal's 64K bit ROM, Memory capacity will be 8K PROM and up to 8K bytes of RAM, As well as being used for

hobby computing and as the basis of a home computer. Bywood also expects o market in low volume OEM areas. As with other Scrumpi kits, Number 4

For those with cash in hand, stand worth a visit was that of Jade Computer Products, of Lawudale, California. On

hearing about the show, tha company arranged to fly over from the US with a range of hardware and books to sall off at the stand. Them included a Shugart 801 A floppy disc drive for £305.50.

Getting a first public showing at the DIY exhibition was the recently introduced single card computer from Cromemco. Displayed on the stand of Comart. Cromeinco's UK ogent, thia 280 based system is specifically intended for the OEM process and industrial control markets.

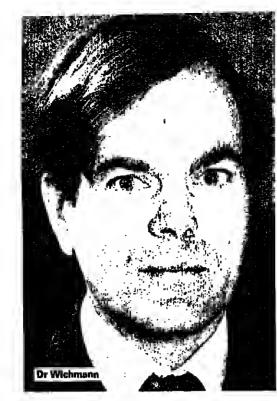
To increase its penetration into this market, Comart is planning to enter the manufac-turing field with a backplane board and chasals system for small OEM quantity applications. First samples of the S100 bus back-plane are already available, and the complate package should be ready for aale about two months.

On the software front, the company now has avoilable a modified version of the Cromemco 16K Basic that accommodates use of the North Star floating point maths card.

PDP 11 INTELLIGENT PACKAGES INSTA-PAY INSTA-LEDGER POP II/AND MICRO-FILE COMPUTERS . HOW DO WE GET THE IMPOSALALE ... -ATAILOR-MADE SYSTEM -WORKING TO OUR COMPLETE SATISFACTION. MINTELLIGENT -IN THE NEXT 14 DAYS -WITHIN BUDGET PHONE COMPUTERSENSE on 01-404 5011 or 01-251 0520 INTELLIGENT PACKAGES - WORKING SYSTEMS



COMPUTER WEEKLY: June 29, 1978 A mini problem for the



The Pentagon's project to create a state-of-the-art language has attracted much attention. The last similar programme was the US Navy's development of a standard language for data processing. This resulted in Cobol and the fruit of the current work is likely to be at least as widely used.

In this article, Dr Brian Wichmann of the National Physical Laboratory reviews the progress made to date and examinea some of the features of the language requirements and proposals. Dr Wichmann has been closely involved in European work on the

US Ironman project

By Dr Brian Wichmann

published these proposala with-

out identifying the contractor

responsible. Each language was

given o colour code so that

comments could be elicited on

tha language designs without

revealing the design team res-

It has now been decided that

Red (Intermetrics) and Green

(CII-Honeywell Bull) will con-

(Stanford Reaearch Institute)

and Blue (Softech) will not. In

the next stage the two contrac-

tors aelected will rafine their

designs to meet Stealman and

ment o piiot compiler.

It is DoD's intention to make

machine independent compiler

freely available and hence, after

writing a few code generators,

Implementations of the final

a wide ronge of muchinas. How-

ever, the complexity of tha

language is such that compliers are unlikely to he very fast or

Hence, there may be problems

nuguage should be avelinbla on

eekly will know, the US Deartiment of Defence (DoD) has amme to design a new langu-ge for "embedded computer stems" - ie in UK terminogy, real-time systems.

A major objective of this proct is to reap the benefits of andardisotion. Whereas the K Ministry of Defence uses ily one high-level language, imely Coral 66, the US is curntly using over 350 languogee about 250 different machina

The US has shown great intrest in Coral 86 and the success f the UK Ministry uf Defence In itublishing it as a stondard. owever. It has decided to aim a much higher lavel langunge, propriste to the needs of the

80s nnd beyond. The project sterted about rec years ago whon an initial ecification of the requireced under the tille Strowman. nis was loter successively fined in a series of documents illed Woodenman, Tinman,

in running the compiler in a onman, and Ironman (revised ment. On the other hand, the ily 1977). The Ironman requirements isnguage designs do not sauma the support of a larga oparating ere used to assess existing system and henca compiled programs could easily be run on ppropriate as a basis for deve-opment. It was felt that PL7] minicomputers as well as the igol 68, and Pascal could be sed as base languages, and

better microprocassors. In what environments is the ianguaga likely to be most enders were requested for popular? Clearly, the relative anguage proposals to maat tha ronman (revised) specification. benafita will dapend upon current usaga. Moving from Corsi 66 would be a significant step forward whereas those already in August last year four con-ractors were chosen, oil using ascai as a base languago. in using RTL/2 may not find that

dafinition RATIONAL-NUMBERS: 36 RATIONAL =

> NUMERATOR INTEGER: DENOMINATOR, (1. INTEGER LAST); end record;

function (X: Y RATIONAL) return BOOLEAN: function (X, Y: RATIONAL) return RATIONAL; function (X, Y: RATIONAL) return RATIONAL; MULT

procedure SAME_DENOMINATOR(X, Y) access RATIONAL

[reduces X and Y to the samo danominator]

function EQUIV (XY-RATIONAL) return BOOLEAN! U,V. RATIONAL:

SAME __DENOMINATOR (U,V);
return (U,NUMERATOR);

function ADD function MULT

pure 1. A rational number package using the Green language 2 Fixed point data types.

Many real-time projects are still undertaken in assembly ionguages, particularly systems programming, and in this area the new language could have a

cluded from its study applications which are currently hand-Nevertheless i would olso expect tinue working while Ycllow many scientific programmers to prefer the new lenguage because of its better control atructures,

3 Control over the precision of floating-point deta types. evaluated at complle-time.

5 A method of hendling exceptional conditions (which could be detected by hardware The DoD has explicitly ex- or software). This enables a programmer to conclude an activity cleanly in splie of unexpected

6 Encapsulated delinitions to reduce the visibility of names and increose the modularity of large programs.

it is the Pentagon's Intention to meka a machine-indapendant compiler however, tha complexity of the language ia such thet compilars are unlikely to be vary fast or small. Hence thera mey be problems in running the compiler in e typical minicomputer environment

data structures, and precision

What are the main advantages the new language would give? Many of the features are already svallable in Pascal and can be briefly summarisad as

 Good control structurea (if - then - ciaa, for, repeat, while,

 Good procedure structure. with nested scopes for variables. Powerful data structures without any run-time penaity... Arrays (of static siza) and out garbaga collection or a-

complex run-time aystem.

Simple variables can have checking Typically an integar (i) is declared as being in tha subrange 1...N and hence A [I] ia valld if the same subrange is

to ba of a type which has only a cassful languages - allows a restricted set of named values." For instance a variable of type DAY would have one of the values MONDAY, TUESDAY, WEDNESDAY, atc.

However, mony further facil program — against (boolean lities are demanded by the Iron; expression) — meaning that the man requirements resulting in a stated condition should be true language which is much mora if the compiler can show that powerful than Pascal without the condition is faise, the the reducing the capacity for compila-time chaoking. Thesa

I Data storaga whose size is data dependent (like Algol 60

7 Fncilitias to run parelial procasses with low-level

8 A mathod of specifying the physical loy-out of data items. low-lavel input-output, and a means of writing or incorpo-

synchronisation primitives.

Facilities 1,5 and 7 may have a small run-time panalty, but the power provided to the program-mer makes this worthwhile, Ail the other extras place a significant burden on the comer but allow the programmer

A major emphasis has been execution (with checking) of formal varification methods is Used to declare the array. to be preferred. Good dasign — Variables can be declared which is evident in the suclarge amount of checking with-out placing an undua additional

burden on the programmer. For example, the programmer cao insert a atatement in his program will fall to compile, but if the condition connot be additional features are as fol, verified by the compilar, appro-lows: priate code can be generated to check the condition at run-time. Both Red and Graen have

types and no implicit converions are available between 4 General expressions to be types. Hence, the typing mechenism acts as a barrier between variables so that the user can be more confident the progrem does as he intended.

> An Irunman requirement is that the strong typing mechanism should be preserved with separately complled routines. Hence, the parameters of subroutines will be checked in the some way as every other con-

In spite of the progress made in two provisional lenguage designs, muny problems are not yet fully resolved

For instance, Ironwan required that "allasing" shoold not be permitted. By this, one means that two entitles given a distinct neme in a program must be distinct. Clearly if two pointers X and Y bolh point to Z then ollasing occurs hetween X ond Y. ironman dld not require that this should be avaided, provided that Z wes of a type that was aiways accessed via n pulnter.

Even with this relaxation, ailasing is very difficult to prevent in a language of the com-plexity proposed. For instance, if X is global and Y is o paramoter by reference of the procedure P, then P(X) will cause X and Y to be allased if the global X is accessible in P. The Red language avoided this by insisting that he procedure P Imports X so that the call of P can be rejected.

to code quite complex tasks with All this may seem rather pedantic, but it is necessary if verification mathods are to be placed on the ability to perform used with large software sysas much complie-time checking tama. For instanca, given a as possible. With many complex matrix multiplication routing range limits imposed - permit- as possible. With many complex matrix multiplication routine ting axtensive compile-time weapons systems, live testing is MUL (A,B,C) with C being the either very expensive or not result; the routine will usually possible at all. Henca, simulated fall if C=A or C=B, but how many systems clicck for this? duction compiler Attacher interesting area for general use.

END ON.

which will certainly require further consideration in the language designs is the handling of parallelism. The Green language is the only one to have n method of hondling tasks which could be easily extended tic a multi-processor system (with or without shared store).

In the Green design, each task lins parameters called "boxes" which are data items whose contents are transferred on the basic primitives send und receive. The two tasks which communicate via a box arc synchronized at the send and receive. There is no buffering plied by the mechanism since both tasks necessically have space for the data transferred.

Now that Individual microprocessors can be purchased very cheaply, the ability to ex-ploft such systems within une language could be very impartant. The Red language contains a 'monitor' system which allows mutually exclusive access to shared data from norallel tasks. This is un important regulrement when acveral tasks run on one computer (and hence sinre store). This requirement can be programmed using boxes in the Green language but the code would be more cumbersome than with the Red language.

The next phase of the project will last until April, 1979. The contractors will produce a more rigorous language definition and o doubt revise the language in the light of comments received. A pilot cumpiler will also be produced for each language so that coding experiments can be underlaken to validate the choice on the language should be made in 1978, but even then it will be sume time bafore production compilers are available

TYPE ARITH-STATUS ENUMION, OVERFLOW, UNDERFLOW): AR'S, ARITH-STATUS INIT OK:

ON X-OVERFLOW, X-UNDERFLOW, X-ZERO-DIVIDE, X-ANY IN X = (A'F(B) - B'F(A)/(F(B) - F(A).

DO SELECT LAST EXCEPTION FROM CASE X-OVERFLOW, X-ZERO-DIVIDE

VAR A,B,X FLOAT (5, -1.0E7..1.0E7) INIT 0.0:

CASE X UNDERFLOW -> 5 - UNDERFLOW:
OTHERWISE -> RAISE LAST: EXCEPTION: END SELECT:

strong" typing as in Pascal - that is the user can define new Figure 2. Handlog arithmatic exceptions in the Rad language.

SMALL BUSINESS SYSTEMS

Although small business systems were first aimad, naturally enough, at small companias and first time users, they are now also accepted as key elements in the development of distributed processing networks in large organisstions. The continual reduction in tha cost of minis and micros has masnt that small systema have bean sble to take over much of the traditional VRC market and, at the

othar end of the scala they ara moving into the province of the lower ranges of mainframa. In this first srticle Kaith Ruddle, of Arthur Andarsen and Co, looks at tha confusing choice now open to

usars, and on following psgaa David Shirlay, of Computer Information Centra, outlinas software requiraments, and Harold Laa, of tha NCC, offars soma guidance to nawcomers to computing.

Confusing choice in a growing market By Keith Ruddle

tomer needs have become an

With one or two notable ex-

based on the same central unit.

pendent unit of a large luisiness, s fading an increasing number of choices at the lower end of the business computer market. with miniconsputers and nucroprocessors becoming cheaper by he minute, are now competing favourably in the areas where accounting machines and visible record computers were preylously dominant

Similarly, the overlap in applications between these newer machines and the traditional small moinframe products is incoming considerable. The result of these ad-YANCES ADDISTES to be there confusion for the first time user. Furthermore, a new and targe market of small bostnesses is wing introduced to all the prohleins of dobbling in the ta dustry: systems plaoning, design, implementation, operation, and support

As an overview, one should first establish what "speak bardness systems" really diency, then look at some of the significant trends in the market. and finally highlight the prodems to be addressed by the small comfuter over

In common with the rest of the computer industry, teromology is applied loosely at the lower end of the murket A "small husmess system" generally refers to a small comordinary office environment and performing comoterrial business applications. The hard ware can range from visible record computers, through cassette systems, finnpy disc systems, to disc based midicionpulars and small mainframe

Aithough this definition covers the whole range, the real changes and growth have been seen in minicomputers Even here, the definition is hiurred, mes "minicumquice" is used simply to describe the phenomenin that has occurred at this end of the market. It is safe to say, however, that machines with desk-top terminals, and built-in data stnrage on dice have become the melastream products, rather han an expensive, new lechno-

the traditional commercial opications are will prominent, such as order processing. iccounting ledgers and statislies block recording payroid and lifes, to some extent, more sophisticated manufacturing and control. However, more landed and control. However, we are seen the some have to include the straight of the renewed attack on living the final and very landed the final and very landed the straight of the final and very landed the straight of the seal business the user. Application software, to permitted the control residence of small business form the business functions residence of the control res

case, the local processing remains as a small business application, with an intelligent commuter at the local site. It is however, linked to a mulnfrome either to provide co-ordination of business information through a central group function, or to have acress to more powerful

Technological advances in integrated circultry have had an impact in several Industries, from the calculator market through to microprocessurs for controlling cars and doniestic appllances. In the business computer market, the effect has been equally drustle, and will continue to mush down the hardware cost per unit, and increase the processing capability The stage of "a computer on a chip" has not yet been reached rommercially, but is rapidly armoseling.

These trends in hardware, by reducing the cost for thu some. or letter level of performance are making decentralised and distributed processing remomically sensible, and cost effective computer processing within reach of the smaller office Smalle disc bused municipalities with limited peripherals can now be purchased for under £10,000. Indeed, for this type of system, the peripherals -- printer, store, -creen and data entry terminal

-- constitute the major part u the investment. Processing hardware is becoming simpler with less need for manufacturers to design sophisticated control logic.

Two simple minia can be betier and cheaper than one complex machine. The trend in processing cost one give each local manager a machine of his own, and he need not necessarily worry if it is nut used to its full apacity. As product inaturity comes to the minicompular market, competition is getting tougher, with bierally a manufacturers producing cheap reliable and flexible hardware. With such a level of competition, however, many of them will not

he around in five years time.

The rapid fail in hardwara costs is emphasising the high cost of software. Software develupment ramains very labour untensive, und labour costa are increasing it is only recently that improvements to minicon puter systems software tools have been made. Troditionally, qualitators have supported

To provide a cost effective busi- available, prospective new cusness application, packages suit- tomers still approach the deciably modified for particular cus- sion to buy a computer with ilttle forethought and planning. industry in their own right. This results in not only a wasted Compared with simple accoun-Investment but considerable ting mochines, however, small disruption to a business that business systems con support complex, integrated applicamay well have been running smoothly. Smaller companies tions which bring with them typicelly have no expertiso in mnjor problems in design and dats processing and the same mistakes are repeated across many first time users. It is posreptions, the oquipment able however, for management to take the correct preliminary

genred to providing the comsteps before making an investpletc "systems service" that we ment decision. are used to on the larger Firat, in systems planning, machines, including application which is reolly an extension of normal business planning, software products and support. This has resulted in software or managament can identify the mnjor business priorities, and approach of providing the whole the overall systems objectives. package of hardware and soft." The company must decide what ware. The original manufacoverall systems improvements are being snught. Once some agreement and cummitment is turers are often content with selling ut a discount to this intermediary, and the latter deals directly with the final customer raechad, thon management should apand some time in for all aspects of the system. This educating itself as to how "smail leads to a proliferation of business systems" might apparently different machines achieve these improvements. The prospective new user often has little or no concapt of what a

The number of potential users computar is, or hew it can proof small husiness systems is vide "systems solutions." growing, ond more companies than ever ora becuming exposed Onco this point is reeched, to the pitfolia well known to then the secend phese of deveioping a written systems specification can taka piace. For personnel experienced in the in-Although expert sovice is the unsophisticated cempany,



Keith Ruddle is a manager in the Management Consultancy Division of Arthur Andersen and Co. He

with no axternal assistance, this may not result in a highly technical product. There are, howover, basic guidelines that can be followed, and the vital goal is to establiah aoma form of statenpprocching the ampplier of tha dware or software.

Salection of prospective ven-dors requires some basic criteria to be established. A guestionnaire and checklist can be developed against which proposals

installation and maintenance of hardware and software, together with specific questions on Installation experience. Finally, before a decision to proceed is made, the benefits nd costs must be established,

can be evaluated. This must

togather with a schedule of iementation steps, effort, and timescale. A small business system is not

easy to install and run, and should not be regarded as simply grandlose accounting achine. The trend is, however, owards "turnkey" installation and simple operation. In these cases, the supplier or perhaps a contracted software house, provides all the program develop-ment effort and installs the machine. Training for operators is siso provided.

Even in this approach however the local munagement must perform particulor dutios to ensure a auccessful installation: close monitoring of package de sign and modification to the specified regidrements; full project control over timescala and cost; detelled porticipation on a comprehensiva systems test; planning and organisation of the changeovar or convarsion activfull user participation; and finally, ensuring that support is continued after conversion.

Announcing the infallible check digit.

If your stationary requirements include the necessity fer complete accurscy in computer input serial numbers, then the surest way to ob this is to include a weighted check digit in that

This system provides your computer with a checking system to verify the serial number, but is only as good as the system that prints the check digits themselves. And, in most print systems, nevitably, errors do occur.

However, at Roffs Print, we have overcome this problem. The printing of the chack digit is controlled conventionally, by a computer, controlled numbering methics, but what makes



second ettendant computer which double-checks numbers are thus affectively svoided. Ws are confident that this system of double-

check makes our sarial oumber/check digit printing system infallible. Moreover, it can be applied to any part of our comprahansiva print service which includes the production of continuous stationary of all sorts - including chaquas - multipart sets - document pads or books - and security work. Our prices mey well be less than you

So, if your paper-work system is built around the serial number on your computer. controllad stationary, can you afford to settle for enything less than our system?

For further information on how we cen, help, cell Cliff Brown on (0326) 72778 or write to the eddress below.

ROFFS PRINT LTD:

How to choose your first computer

first time user with the same amount of cere as used in the selection of a wife. A mistake at any stage in the process can lead to s great deal of acrimony and disenchantment.

It romains a constant source of aniazement to many mambara of the computer profession that extremely intelligent people, at a high level of management, traat buying computer hardware with less thought than the purchase of a washing machine.

For example, some senior executives of firms who ere themselves in the business of selling, assume that in some way the morketing of computer equipment carries with it a pinnacle of honesty and integrity. This le not intended. I seiling of computer systems is in start has been made.

THE sequisition of a computer system should be treated by the in any form of selling to illust-system contains many similar-contains little or no clerical dissipation. rate, much less emphasise, the possible drawbacks

One firm, which is involved in the construction of houses, gulte happly believed that, when the system had gone live, the aoftware supplier would drop evarything end instantly correct sny software problems. It can only be assumed that rapsirs to their own houses were carried out in such a state of willing-

From such storles thet circuiste concerning disastroua failure of computer systems, the reader may be left with the impression that the world of computerisation is beset by pitfells left to trap the unwary. This may not be absolutely true but, with that thought at the hesten to add, to imply that the back of your mind, a reesonsble

SPECIAL LOW PRICE ARRANGEMENTS FOR VISITING OVERSEAS TRADE FAIRS

itles to the acquisition of asy piece of ressonably expensive machinery. The major difference lies not in the machinery itself but in the fact that a computer system will require programming. The computer programs will have to be written by people. More importantly, these programs will probably, even if it is only indirectly, be specified

> fined by yourself, it is expecting a great deal for a computer specialist to provide good satisfactory solutions. So, how do you go about acquiring the perfect computer adution to your current business problems? First you must

PC Elactrical-Electronic Presa Ltd., the world'e largast publishars

of computer, electrical and electronic journals, have made apeciel

arrengements for readera wishing to visit important overseas trade

fairs. The cost, in most cases, is little more than the normal air fers

by you, the first time usar with

little or no computer expertise. If

the requirements can't be de-

cipline and problems are inherent, due to the type of staff or other valid reasons, these problems must be solved before computerisation is attempted. Computers will not solve the problems of organisations which cannot msintain a good manual system. In fact, the Installation of a computer will only aggravste these problems.

reasonably efficient existing method of working, why should you computeriae? Even if you know the limitations of the current system and can define the requirements of your computer system, what will it cost and is it

It is difficult for a first time user to have the necessary expertise to answer these ques-Installing a computer. If the tions and, therefore, it is recom-

Assuming that you have a mended that good, prnfessional and Independent advice is sought. This miny oppear initially to be expensive but then, mistakea at this stage can be extremely costly in the long term. After all, one is unlikely to satisfactorily cure toothache ithout resort to a competent

> Thus, a feasibility study should be carried out. This will consider the likely requirements, benefits and costs of a computer system. The justification will then be o comparison of the costa against the benefits. make the final decision os to required.

If the uutcome af the fcssibility study has indicuted that you should prugress further, the next stage will involve a more detailed definition

This will involve the identification of each application srea such us soles ledger. purchase ledger, the volumes and type of input und antimit with timescales, the definition of computer record contents, etc. It is also important at this stage that a reasonable estimate of any future enhancements is tunder document against which auppliers may submit proposals. The prepuration of this does-

ment gives a two-fold advanttage. Firatly, the definition of computer system requirements enfarces s high degree of hrain searching and discipline within the user's organisatinn. Secondly, because every proposer has been given the same information, o comparison of liks sealnst like can be medc. Aa in the feasibility stage, pro-

easy as driving across Piccadilly Circus blindfolded.

storage, swap ratio, unibus, megabus, etc - not only are the words confusing but it is difficult for anyone to compare the performance of two or more tensive benefits.

Harold

How doos the first time user go ebout the jungla of computor selection? Harold Las (laft) of the National Computing Cantra, says it is an acquisition that should be trented with the sema care as usad in the asisction of s wifo - a miataka at any atega in the process could loed to a grast deal of acrimony and disanchant-

machines that operate under different criteria under what are, nccessarily, projected circumsimple as file storage capacity-1,000 records each 20 bytes long makes 20,000 bytes of storage. Or does It? Any computer professional will say that this is not true, but it is this type of srithmetic that appears all too often

So how does the first time user go about the juagle of selection? Seek expert advice. Even if the experts connot be absolutely certain, they should at least be Since the benefits may be tan-gible, reasonable to cost justify, safety in the sense that any or intangible, difficult to cost machinery recommended will be justify, it is up to the user to at least as powerful as is

One reasonable method of selection involves the identification of factors which are important to the user. These factors are then graded la Importance and each proposal marked. A multiplication of the scores and grades then gives a mathemutical Indication of the must satisfactory solution. There is obviously more to the final selection than the mathemalical score but ut least the reasons lighted the spare can then be identified and discussed.

Proposers should be asked to submit lists of existing clients. made. All this information Ring as many as is practical, should be put in the form of a particularly to your area. Supprot can be very much area do-

> The type of applications software that can he used falls into two broad cutegories. These are software packages, existing computer programs that will, for example, process a sales ledger, and o tellor-maile system, consisting of new programs designed and written specifically for a particular client. Cost is generally a major foctor in declding which approach is to be made, although it is often e which pravides the most sat

tem installation will create pro-

Thrus blindfolded.

Re-antrant code, virtual Finally, whom all about you torage, swap ratio, unlimit appears to be falllog into one gigantic heap, remember that computers are lostalled suc-cessfully and do produce ex-

DURING the past five years, you need: file creation and Executive 15 is a typical Will be available on it. Since the hardwore advonces in the design of small business systems have receipts posting, stock issues been more dramotic and more posting, slock allocation, publicised than in any other area purchasa order posting, file list, of computing technology. The price of complete small disc syscompleta or selective and list of

been around 300%.

application, ic about 20% of the

hordware price. The some

amount of software effort is still

required tuday, and linking that

budget to the rise in cost af

living, one would expect soft-

ware to cost at least £10,000 per

main application. But this would

represent 100% of the hardward

price, and the potential buyer of

The computer industry is,

therefore, faced with a dilenima

A CIC Executive 15 processor with

two disc drives, in its new pedestal cabines, with the 382 video print-

consider such o software cost.

tems in particular has fallen to rcorder level. the point where several aup-It is totally impossible to oliers offer a complete system specify, write, and test any one VDU, two diskette drives, proof these programs in less than a cessor, and printer - for less cessor, and printer — for less than £10,000. Ten years ago a week. The minimum charging rate for programmer time system of comparable power needed to give a software would have cost £50,000; even organisation any hope of five years ago it would have cost making a profit is £300 per man £30,000, so the improvement in week. Thus the stock control price-performance ratio has application alone should cost 2,400 plus at lesst £300 to install Unfortunately, aithough the it at the customer site and to price of the equipment hos changed, its design principles troin the operator. Multiply this figure by an average of four ond the systems and programopplications installed on cach nung effort required to install it small business system, and the hove not. The budget for softcomputer industry should be waring on Interactive disc syschorging oround £11,000 for tem five years ago was in the software per installation region of £7,000 for one minin

RECOVERED THE PROPERTY OF A PARTY OF A PARTY

In fact, it is charging less than hulf this figure. The difference is often made up by severe loss of profits by the supplier, and sometimes by impossible schedules, shurt cutting on program testing and lack of oparator

Flow can we legitimately close ths gap between whal a user should puy and what ha is preu small business system will not pored to pny? One possible panacea is the program puckage, written once but installed at many users. In theory, this approach should be viable at 10% of potential users, but reulity la sadly different. Take an application such us sales fedger

One user will Insist that discount be posted separately from cash and that it should be shown in a separate column on the sintement. The next user will unject strongly to any reference to discount an his sales ledger. The result is not one package but complotely different sets of programs for ledger posting and talcinent printing.

An even more fundamental diffcranco between customar demands is that while most aales ledgers work on the "brought forward" principle with cach

control, involcing sales ledger, time and o vast budget to create bought ledger, and nominal a package generator, and hard-this represents a total of about ware developments are now potential by ingressing if anyonic doubts curring so quickly that by the time a package generator was said inst out the separate prothe equipment of CIC's The example, on stock control. The development of CIC's

Prices cut too low for health of the industry By David Shirley

example. When it was launched in January 1977, it offered a "glass teletype" VDU with upper case only, a standard memory size of 24K, 2 or 4 disk-Items which have fallen below ette drives, and a 30 chps matrix printer. In April, 1977, the standard memory size had been increased to 40K and the print speed to 100 lines per minute. In October 1977, the VDU was changed to a model with upper changed to a model with upper and lower case and direct cursor the arrival of the hobby comaddressing. In April 1978, a new terminal was added combining a sion that a complete working daisy-wheel printer and an even more sophisticated VDU in one unit, including its own buffer of 7680 characters. In July 1978, a

can it possibly be produced sgainst such a rapidly changing hardware background? Tha truth is that the computer ladustry is cutting its prices too low for its own hasith or that of its customers. This lemming-like rush to the brink of comm

generator requires an elspased

time of at least one year, how

computer system should cost less than a secondhand car. In fact, the price of hardware which will work reliably for 10 million byte cartridge disc years in the environment of a

small user who is changing production of s package functions, programs, and stationery three or four times e day has probably reached its lowest vioble level, particularly when one beors in mind the high cost of selling to the small bustness user. Anyone who believes that s

progremmer is someone who translates simple business arithmetic into computer codes should reod the inland Revenue's latest publication Specification for PAYE Tax Routines — April 1978 Edition. Today's systems programmer,

therefore, requires simost as much financial knowledge as e chartered secountant and has to rathar than by any i know his equipment, ita factor.

David Shirloy, o puter Information And ha warns the lamming-lika rush brink of comm eccelerated by the of the hobby co "which is fosteri illusion that a co working compute tam should cost le secondhand car.'

The computer ind

cutting its prices for ita own health of its customar

operating aystem, and gramming languege Such knowledge is not easily, yet It must be thoroughly end carefully if the installa operate auccessfully. puter industry cannot skills sort and at the s maintain a reputation fessionalism, and at p reputation is certainly The cost of a small bu stallation may shortly irreducible mloimum di the cost of software an

"Computer Weekly", "Data Processing" end "Systems international" present

Britain's major peripherals and systems exhibition Olympia, London, December 5, 6 and 7

10 am to 6 pm (closing at 4.30 pm on the last day)

Now in its aighth year, Compec is bigger periphersia, small business systems and than aver in its naw vanue and lestures mini and microcomputers, Here are

a wide choice of computer Adler Busisesa Systema Elbit Dela Systeme Electronio Srokara Arnpax G.S. Anderses Jacobser **EMI Tachnology Data Comm** Beald Timesherisg Benses Electronics Euro Elactronic instrumente Sorst Elscironics Eachange Telegreph Burni Hill Elactronice Febriek Computer Components CAI (Computer Aule mello Celeemp CAP Microsoft Cantronics Dele Computa Chorry Electrical Products Citer Systemu Cole Electronics Confecence Computer Liek UK
Computer Instrumentation Ltd. (Cli
Computer Liek UK
Computer Mert
Computer Workshop
Computer & Systems Engineering
(CASE)

Femoli International Instrumenta Feadback Data Fungue Compular Products Gerage Managemant Servicea Geest Minicomputer Systems General Audio & Daje Communicat General Automation Gevake Electronics & Auto Hemilton Rentale Heywood Electronic Associates Hewlatt Packsrd Honeywelt **Hyperon Computers** IDA International Dale Automation Internel Computer Systems I.S.G. Dele Salea tTT Susinese Systems

ITT Consumer Products Jequerd Systems
J.M. Factors Computer Supplies Kayirainer K & N Electroni Licon A Division of ITW Lynwood Scientille Dovelopment Mellordeta Memorex UK Micro Ceneultant Midectron Mini Computer Systems Moduler Computer Services Inc.

Nicolet instruments Penny & Giles Pericom Date Systema Peripheral Hardware Perkin-Elmer Data Systems Portec International Peterborough Development Corp Plesazy Communications & Data Systems Pleasey Peripheral Systems Post Office Talecom Potter Instrument Co. Pregme Prentice Hall Pronto Electronic Systems

soma of the 200 axhibitors:

R & H Applied Dynamics Racal-Milgo Rair Tarminale Raytheon Cossor Data Systems Semaphore Computer Systems
-SEN Electronics

Sigmu Efectronice Systems Storage Technology

Tektronix UK Telecompuling
Telefile Computer Produ Taess to struments

Transfet Communication Frend Communications

USCL Varmont Research Weekex Co. Wilcox Computers

Willis Computer Suppl X-Deta Zygel Dynamica Limited

December 5, 9 & 7, National Hall, OLYMPIA, LONDON

free pre-registration lickets for Compec 78, which will save me heving to pay \$2 at the deor To Compec Tickets, Room 821, Dorsal House, Stamford Street, London, SE1 9LU, England.

ing terminel which incorporates a YDU and Sichps metal dalay wheel but includes - travel by schadulad airline from Hasthrow and will be at Fox Associates in Pad-dington, London, where it will be used for word processing so well so data processing. Manchaater * first-class hotel accommodation * arrival and fesalonal advice is extremely useful, and probably very departure transfers * samlesion to the trads fair * services of en combination of existing packnecessary, at this stage.
It is appreclated that the experienced tour manager. The current programme comprises the ages and tailor-made packages C. P. Clare Electronics following tours. upon open item accounting which requires cash to be offset CPU Compulers Cramer Electronics factory solution und, therefore, actual definition of requirecost may be secondary. Existing ments may be difficult, given a against individual invoices. Crow of Reading lack of knowledge as to the software packuges are generally which is rapidly attaining crisis

Even this variation plus disproportione. With hardware count variation means that a Dacell Group capabilities of computers but, cheapor and have secondary To obtain a brochura and booking form, tick the box against the tours in which you are interested, complete the evan without advice, s serious benefits of being, in theory at exclusively appointed itavel egent. Commercet Trade Travel Ltd. Ceriste Heuse. 8 Southempton Row, Londen WC1. Telephone: 01-405 8866 or 01-405 5489 prices falling to absurd icvela. suppliar has to produce four Date 100 Systems any rate, tried and tested. attempt must be made. It is usolisers are still expecting software asles ledger packages rather Common omissions when es-timaling costs include monthly less to define requirements with Dale Design Techniques Date Dynamics Services to cost 20% of hardware, than one, but in practice there such phrases as "make the although all the factors influen- are other variations in posting ting the real cost of programs have been rising rether than falechniques and output forms organisation more efficient." The "hows" and "whye" bahind partitioning, operating system which bring the total number of Daja General Date Graphia SICOB [softwars, training power supling. Unless a radical change can be produced to users attitude to possible sales ledgers to about Ssptamber 20-22 such statements must be clearly ply, air conditioning and file conversion. Your £20,000 purchase is suddenly costing understood, together with the necessery justification for each section of the requirements, software, the gap between what they expect and what they are prepared to pay for it will continue to widen, while professional standards will go by the board in a few parameter. ELECTRIC £50,000 to run over five years. Successful Installation of any VEHICLE EXPO even if this is not put in the October 3-5 specification. Computers, at all levels, have the in-bullt facility computer system is ultimately sheets, punches them into a large mainframe computer, and out comes a specially compiled and lellored "package"? This approach cao certainly work. depandent upon the complet board in a frantic affort to install sophisticated equipment in the minimum possible time.
The small business user lathe involvement of all concerned. to reduce forests to woodchips both user and suppliar. The and make millionaires out of NUCLEX . paper auppliers! After receipt of proposals, the implementation has to be con-trolled in the same manner as October 3-7 lashua Computer Products NCR did it many years ago with BEST for the 315, and Burroughs local point of this problem baaelection process will begin. At this atage, if not before, the user will realise that the amount of any project, be it the erecting of a building or the installation of cause he cannut justify the cost Digital Equipmen of the equipment unless he uses it for several functions. A typical repeated this success more ELECTRONICA manufacturing machinery. Fall-ure to control a computer aystange of applications for one user would be payroll, stock.

Link for the Link for largon used and unnaceasary iterature that most suppliers produce, makes asiaction as blems in excess of those inberent

epresentational.

torically algnificant pieces of

It seems obvious that there is a

serious need for a notional

museum of information sciences

and computing. A single gailery

in a major museum, as exists at

present, is insufficient to be at all

The computer is revolution-

ising acciety and historical

material ralevent to this is fast

disappearing or in some cases

uraging better contacts and became apparent that many hisoperation between schools d industry. At this achool. rough the generosity of veral local firms, we have

ms may have and would be illing to donate, either to sintain the school'a computar tivities or for a small museum computer technology we are eparing.
Given that many colleges of Coiney Heath Lana in the course of obtaining education are being closed St Albans

Clearing doubts on post codes rmed by Ron Lindsay's marks in your article "Doubts er Post Office coding" (CW,

ay 25). His claim that postdes se a businese reference siem hos still some way to go fore it is workable, is just not ge numbers of firma and or-

postcode file is the most comprehensive reference aystam in

WHO ARE BUYING

INDEPENDENT

other computing

Our display advertisement manager, Harry law willing for your call on 01-261 8359

publication surveyed.

*N.B.R.C. Businessman Readership Survey 1978

SURVEY REVEALS

35,139* businessmen responsible

for management and computer

services read Computer Weekly

every week ... 19% more than any

needed to cope with growth. It is not possible far me to From the start, it was extoi the benefits of postcodes specifically planned to cater for expansion and to last at least erested, a free booklet entitlad 'Using Postcodea in Business As numerous businesses have Systems" ia svailable from Postfound to their edventage, the code Consultancy, Postsi Headguarters, London, ECIA 1HO. PETER H. YOUNG

could aurely be a potential site.

The value of such a museum for

educational purposes and future

historical and sociolagical

research wauld be considerable.

Even if the idea of a national

Computer Weekly readers to the

museum is not original, i would

be interested in the response of

Central Haadquarters tha UK with unique facilities for

LOOKING FOR PEOPLE

COMPUTER SYSTEMS?

Chance to influence M. J. COOKSON Head of Computer Studias Nicholas Breakspear RC School Cobol development

pedfication (CW, June 8), but he is off-target in some of his

LETTERS

Dorset House, Stamford Street, London SE1 9LU

To: The Editor, Computer Weekly,

I have heard a number of explanations of the requirement to lar machine's arithmetic registers ia not one of them. My favaurite explanation is that 18 digita wera necessary to represent the number of cents in ths US Gross National Product,

In the longer term, anyone wanting to influence the developmant of Cobol or the Conmon Operating System Control Language, can write to Codasyl at PO Box 1808, Washington DC.

Journal of Development and i

know of no reason why it should

not be adopted for the next ver-

sion of the ANSi Coboi standard

which, at present, is being deve-

ANSI was due to begin consideration of Procedure Division

elements only in March this

year, and it is unlikely to have

complated this task in the two

loped by ANSI.

meetinga aince then.

PHILIP R. BROWN

Britain— 2000 AD

CONGRATULATIONS to David Butler on his winning essay (CVV, June 15]. Enteroi ildnking leads on to placing ell the Green Circle Pion people in under-ground houses — before 2000

A group i was once associated with, oakulated the the whole UK population could ge into individual "deinched" underground houses on o

quarter-mile grid,
Leaving Britein with no pierning blight and even more green
and pleasant lend for yeer 2000
with infosce.

Being fair to the PO

The

value

standards

YOUR report of the internatio-

nal conference in Paris on

(CW, June 15) mixed up two

senarate points i was making.

First, there are carreally

about 350 authoritative

stamiards relevant to the use of

computers. Ahout 25% of these

are upgroded or amended each

year, and there are about 80 new projects in hand. The only source of information about

these is a feature in the Com-

Secondly, I contrasted the

achievement in establishing

standards by the CCiTT, which

now has about 65 dotn trans-

mission standords, some of great

sophistication, with the iSO

performance in dato tronsmis-

sion. The ISO group has pro-

duced over 1,600 documents but

only 11 standards.
The CCITT workers know ths

value of standards, but com-

nuter scople are not sa

mutivated, However, at a recent

iSO meeting, the UK challenged

the others with these facts, with remarkable results. So we may now expect an improvement.

Brilish Standards justitution

I WAS puzzled by Puzzler's maswer (CW, May 15). You really didn't have to go to oll

that trouble - any self respec-

ting soccsr muniuc knows that if

you lose one mutch and have

unly nno gonl senred against you

in three matches, you must have

Please make future puzzles

STEPHEN WATT

even easier, since I don't have

balance by involving the PO in

the development of the event. its presentation will be aubjected to

critical examination from major

users and consultants ond

during informal sassions, from any participants with something

While this may not be the

perfect forum, at least the

prisoner is allowed to speak on

his own behalf before sentenca is

tho time in work them outl

Too easy

for some

been benten une-nll.

HUGH McGREGOR ROSS

Duta Prucessing Standards

puter User's Year Buok.

standards for computer users

on the treatment of the Post Office at a recant DPMA contember, "Poat Offico Telecom munications - the way ahead? we have tried to achieva this

The problem of the representation of monopoly organiaations at independent conferences is an exercise in traading the narrow line batween providing a salas piatform and promoting a kangaroo court. This problem is exacerbated in the case of the Post Office, sinca every DP manager has his own horror story about

Just because the Post Office is oly, nowever, and p causa its services are essential to or the user. buainesa ilfe, it ia extramely important to have a balanced information Studies Ltd view of their present facilities Chorleywood

facing the UK microelectronics. industry in achieving these objectives, said the report, was the recruiting and retaining of qualified staff. The present pay and salary restrictions and the erosion of differentials was par-ticularly unholpful. As all user industries depended heavily on

it would be ideal if we could davise e method of verbal communication between machine ond mea, end apply this same system to inter-mochins communication. This problem is the torget of o one-year project which is being carried out jointly between Frank George, Profescor of Cybernetics at Brunei University, and Tom Addis, a research worker at ICL'a Research and Advanced Development Centre nt Stevenoge. It is hoped that both ICL and the Department of industry may become involved in the

project ot a loter stage in this orticle, Professor Frank George iooka at whot the problems are ond the way things may go.

Author of many books on computer-related topics, he was editor of Science Fact', a book which presented the latest echievaments in the diverse fields of tachnology end science. One of his letast booka is Mechina Takeover, which looked at the dangers represented by the emergance of mochine intelligence (Futureview, Jenuery 12).

Machine shall talk unto machine

By Professor Frank George

THE search for sidiable interaction for "how many," tive languages for man-maritime which immediately searches fur interaction has been going on for a long time and has taken many different forms. Lam mainly concerned in this article With the latest attempt, which is then this municulately is encoded new going on, to find an nitionate speech recognition, Icolonus of a matrix, say, where system. But helind the effort lies a whole world at diversity.

le has been realised for several yours now that to loove a salefautory human-like system (urffficial (meiligenre) required hat it line occuss to a natural

Tins hapiles, for simpletion purposes, the need not merely to use, but to learn to use, such a language. For synthutic purposea - this is whore the spinoff and the focus of this article is - the problem is unuagh to be abie to convarse in u notural

language.
With this in mind, we mmediately find o crop of such written lenguages that have grown up in the lust 20 years, and one can think of some like Namer, Baseball, Sir, Oracle, Lip plus a whole lot more besides These "conceptus!" languages provide the necessary backcloth to the search for an auditory form of recognition.

The languages themselves fail into four categories, those with and those without syntactic an-🗱 With and those without an inference making

Most of the languages use list processing computer languages, but this is really incidental to

their capabilities.

They have the ability to injuke a question, for example, and, after interpreting the question, supplying the answer by searching the associated database or by making inferences from the information in the database.

database.

An example would be a question life. The further into 10 distinctive featiglis us 1. It is a question; 2. Words of a sentence and they follow many, is the interrogative recur in different patterns. From many, is the interrogative recur in different patterns and services and they have many, is the interrogative recur in different patterns. The pattern recognition matics and involves, within that appears and they recur in different patterns and they have many, is the interrogative recur in different patterns are further distribution.

There are a whose lot or one stury of the surface currently dice, sufficient to act as "phrase in the markers."

The problem is one of pragent was context, both syntax and appears and in the semantics. Even more vital is the many, is the interrogative recur in different patterns are further phonemes and their sentences and their sentences and their sentences. The consonants are further distribution.

There are a whose lot or one stury of the sentency of the matics and involves, within that entered to see the maio in the context, both syntax and appears to the problem with respect to human feeling to talk about the something to talk about Ali this means that the human these distributions.

There are a whose ict unrently dice, sufficient to act as "phrase the markers."

The problem sentence on four matics and involves, within that entered to see the maio it was context, both syntax and appears to the context, both syntax and it was context, both syntax and appears to the context, both syntax and appears to the context, both syntax and it was appears to the context on four matics and involves, within that the context on four matics and involves, within that the context on four matics and involves, which is the appearance on four matics and involves, within that the context on four matics and involves, which is the app

(points of articulation) and bilabial, dental, etc (monner of "how many what?" The minu urliculation). So the recognition follows "liow many," and If of a single word is a major prothere is a further part to the tilem in fiself. The further step is the recogscatence such as "in stare Y"

X at stone Y" is printed out. There is the very minimum mount of molysis invideed, but it can in some circumstances be much mure complicated. It sametimes needs to be more cumplicated to avaid the

vngaries of actual lingulatic terms are defined by the context in which they are uacd.

into looking at X (now) and Y

Now If we changa the modality of the recognition of we have the new difficulty which we do not meet, of course, where the words and phrases are

phunemes and other units of speech that can be distinguished and which we distinguish in human conversation. We can connected speech - the recog-

nition of words connected into sentences. This can be thought of as a Markavian prublem it the number is fund and the the sense that we know that answer "we have 403 sub-livins cach word in a sentence sets as a cuch word in a sentence sets as e constroint on the other possible

But the recognition of this fact Itself depends upon a measure of semantic cinrity; so one mighi expect to invuke a field which has hardly been devaloped as yet — the semontic theory of infor-

The fact cartainly remains

theoretic analysis of the statanicht; and 4. A heuristic approach to the

he likely semantic craftext.

nc we hops to pursue.

conversation. trailing on automatic speach recognition (Addis, 1972)³ and a good dsai of effort has already one ospect of these naw davepidtio form of problem solving gons into developing furthar and this entails concept formanotorious that problems of anguage so often lead us into

being involved in problam solving. Both aspects of the prodomoin by use of new inputs (visual, etc). amount of research effort. At least then there can be

world, like the Winograd world of coloured bricks for building, Science Fact, edited by Profesor Frank George, 540pp. £1.50
 Topaz Boeks. or perhaps somathing more complicated, which would allow 2. Machina Takeover, by Professo



will be held; at the Hyall Houss, Los-Angeles, International Airport, on Sop-lember 19-2]. The seven cessions will focus on new spelications, technology and management directions. The sponsor is the Computer and Automated Systems Association of the Society of Manufac-turing Engineers. Detaits from CASA/ SME; 20501 Ford Road, PO 30x 330, Dearborn, Michigan 48128, USA, tel: 313/ 271-1500, axt 403,

ARTIPICIAL intelligence is the thomo of a conference co-sponsored by the AIS9 and GI, to be held in Hamburg on July 18-24. Details can be obtained from Ocrok Steeman, Depi of Computer Studies. The University, Leeds 2, tel: Leeds 31761, ext 7264/7108.

A SEMBYAR programme on the "State of the Art" is offered by Cootrel Dala Institute during July and August, Most of the seminers will take piace to London, but that on the practical applications of microprocessors and microcomputers, and the structured design and programming workshop; will be held in Copenhagen and Amsterdam respectively; on August 3-4 and August 28-September 1. Deliells frem Tsress-Barnerd, COL 77 Wells Street, London WIP 37E, tel: 01-637 277.

THE seventh conference on mechanised information storage and retrioval systems to be held at the Cranfield Institution of Technology, by Inspec, the Information division of the Institution of Electrical Engineers, will take place on July 17-20. It is onlittled Towards intelligent Information Systems. Further dotails from Cyril

sing, will be held at the Paints das Coogra in Paris, on Septomber 18-22. The con-ference is part of Sicot, the data process sing, hardware, communication ac-office equipment calibition. Details from French Trads Eshibilions, Frence Chamber of Commerce House, 54 Condu-

A VARIETY of courses on menagamen

A BROCHURE of coorses for system insigns from now until December I system from John Hoskyns and Co. Fedetalls contact Velerie Burr. Course Register at John Hoskyns and Co. Ltd. Side

Politicians wake up

• From front page:

Tha chairman of the working party, Eric Hammond, and it was necessary to reversa the current dapendence in the UK on imported integrated oircuits. and added. "The rich nations of the future will be those with their own microelectronics in-

The report pointed out that there could be major financisi returns for the UK from microbased equipment sold on world markets but it was essantial that the industry should have direct access to the latest technologies

for making integrated circuits.
This applied in particular to
VISI technologies.

the success of the micro in-dustry it must be considered a priority subject, the report

NEIL A. JAMES

A major stumbilng block

Protessor George . . . the pattern recegnition pert of the problem depende upon the ebility to receignise at least 40 phonomes in English of which 10 and, above all, the use of hours era vewels and 30 concorants.

most likely match between apparent phoneme patterns and

The relation of heuristic methods to induction and of theory suggests that such a troll s, to say the least, "warm" and

both to semantic information A sight has been made to this family of problems, concen-

the domain of complate human

nnd cun nnswer questinns like that if wo can recogniae a word we must be able to recognise a difficulty remains that sn many sentence; it is largely tha intelligence, so we must not

the spoken word — granted a similar subsequent analysis typed into the computer.

The recognition is now of

nition of a complete sentence.
The difficulties encountered

6 Most of the languages use list processing computer languages, this is really incidental to their cashbilities.

in machine tronslation problema over the written word occur here again, since it is both a problem of pattern recognition and a problem of understanding.

The pattern recognition part of the problem depends upon the ebility to recognise at least 40 phonemes in English of which 10 are vowella and 30 consonants. This is indeed a lower limit to what is required, since each be analyzed phonemes can be analyzed phonemes can be analyzed of the problem depends upon the ebility to recognise at least 40 phonemes in English of which 10 are vowella and 30 consonants. There are a whole lot of different to act as "phrase is required, since each being made, but for my own part in the problem is ons of prage in would like to see the maio the problem is ons of prage in the 10 distinctive fear ettack concentrate on four matics and involves, within that a stack concentrate on four matics and involves, within that

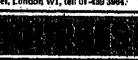
present project lays the has initially to limit his "conversation" from the fully pragmatic, involving gestures and showing behavioural signs of says to each (man and com intention and the like, while ths ter) without now necessarily computer has to enlarge his

bism require an enormou

But the other aspect of the

mon Press.
3. Human Behaviour in the tuter active Environmeet using a Single Spoken Word Recogniser, by T. R. Addis, Man-Machina Studies.

Chamber of Commerce House, 54 Candu Street, London W1, tel: 01-439 3964.



TEL: 01-452 0490





Promodata 2 FOR SALE ON IMMEDIATE DELIVERY

IBM 370/125 GF2

62X CPU WITH 5213/001. FULLY FEATURES. SELLING PRICE £78,000

Also evailable IGM 3411/Q03 with Out I Density and 3410/003
IGM 1403 No 1 Printer with UCS
IGM 3410/3 with Single Censity
IGM 3410/3 with Single Censity
IGM 3340/802 direct access alorage
IBM 3333/1 and IGM 3330/1
For further details and prices for those and any other sequirements
please call Geoff Hendesson on 061-436 6931 as Linda Kene on 01-499
7807.

Ve have the best Tel:01-402 9355

FOR SALE

BELL AND HOWELL MARK DOCUMENT READER COMPLETE WITH PERTEC TAPE UNIT (MODEL 5640-9) AND CIL DOUBLE BUFFER FORMATTER. 3 YEARS OLD, MAINTAINED SINCE NEW

ROCHE PRODUCTS LIMITED

VELWYN GARDEN CITY (07073) 28128

N.C.R. 7200 KEY CASSETTE DATA **CAPTURE TERMINAL INPUT UNIT WITH 2** ADDITIONAL ACCUMULATORS

CDV Mod. 256 Character Buffer. OLT feature. N.C.R. 399 3rd Cassette

UNUSED - EXCELLENT BARGAIN PLEASE CALL 0532 24343. Ext. 80 or 178

IBM SYSTEM/3 FOR SALE AT

LOW PRICE M SYSTEM/3 madel 8 64K emory 300 LPM printer tOM8 4 disk 10M8 5448 disk D/A

x 3277 VOU model 2 with light in Bland stone 37,47 data correct classes in teps and tage to that with tell matting, at a lift spite of the correct cape of the cape of the

Ring 01-525 4291 Telek 922488 (ref 80)

lesse contact Paul Hantson National Children's Home 85 Highbury Park (London) No 1UD 01-226 2035 THE TELEPRINTER SHOP



Midlande 021-489 5558 Scotland 041-221 9761 3, West Chapetow 2181

20:CPS:TALLY 1612

GIVE US YOUR

RUBBISH

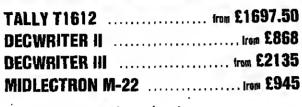
waste to us you will be making

helping us care for over 5,000

hildren in need of love, care nd security. Help bring hap mass into their hyes

e veluable contribution to

ATA DESIGN TECHNIQUES LTD 12 Lagrango Road, Scrahamen



paper tape reader punch

RUBIDE LTD.

Bruce Cane - Tel: 01-658 5906. Telex: 946123

If you have a critical power load you need



ELMORO ENGINEERING

- k Frequency & Voltage Converter Constant Voltage Tsensformers Automatic Voltage Regulators

Voltage and Frequency Monitor

Hond Office Bank Chambers, 50 Bramhall Lane South, Gramhell, Cheshire St. 7 (AJ Tel: 091-439 8042

2 RK05J DISC DRIVES AND CONTROLLER

aveilable for immediate delivery. Used for 12 months only. DEC

CORDON BLEU BREDBURY, NR. STOCKPORT TEL: 061-430 7133, EXT. 11

COMPUTERS BOUGHT AND SOLD E O B EQUIPMENT LTD. Tel. 0783-293818

LABEL 3336-1 turbished and guaranteed d

OVER 126 IBM

GAVENDISH KING & CO. LTD.

Telex 537763

By Order of H.M. Collector of Texes Notice of Sale, by Public Tender of e

DATAPLEX D1200 COMPUTER comprising Input Unit, Computer end Printer units. The machine may be viewed at Mergete, Kent. All Tenders marked "COMPUTER" must be sent to the Collector of Taxes, 14 Addington Roed, Margete, Kant, not leter then 12 noon on Wednesdey, July 12, 1978, who does not bind himself to eccept the highest or eny Tender.

Forms of Tender mey be hed of DANIELS (Kent) LTD., Auctioneers end Veluers, 81 High Street, Broedstairs. Thanet 62017.

HAZELTINE VDU's-ONLY £350!

Yes, lower then lowest-ever price We offer Hezelijne 1200 VDU's (1920 cher, displey)

FOR ONLY £350 EACH!! **EVEN LOWER PRICE FOR**

QUANTITY ORDERSILL Manufacturers maintenance svalishis * ** TEL GEOFF BAWLES ON (0272) 428813

COMPUTER SAVE COMPUTER SAVE was here.

LISTINGS AND PUNCH CARDS Best prices paid EYTON WASTE PAPER

CO. LTD.

Rowin Works, Lynn Road Laytonstona E.11 01-556 2131

MODEL 3 4 MEGABYTE (ALL IBM

FEATURES: 1433-4-5, 7840 2150-1, 4650, 811

ISC POWER ISOLATION

AVAILABLE SEPTEMBER '78 EASE - PURCHASE - ANY

REPLY BOX NO. 1987

any rocord size any field Iormat with any field contents—on many meinfremes and minis. MAKES THOROUGH PROGRAM TESTING EASIER AND QUICKER ione/wide he Special User Golda Olfe

"GIVE US THE ...

Tommes Saltenn OHP 29114 Trictories Ent 64 Unitagel Act Ornugton Kont BRS 4EC

MICE

ools, lood-clothing, treating — it's cost monoy, but all are involved in causig for children — and much more 370/158 S/No. 51 11132

i yau giya us - not toola - bul yo computer waste, we can do the job of cating for over 5,000 children who need love, care and encurity

CAN YOU HELP?

Mease Contact Poul Herrison Netional Children's Home 65 Highbury Park Landon, NE 1 UO 01-228 2033

, wa'll do the job."

PDP II - Computer Time Available

Two Systems:-

PDP 11/34 Operating under RSX 11M (V3.1) with BK05 gartridge disks, etc. POP 11v03 operating under RT-11 (V2) with RXO1 floppy disks, etc.

TEL: 01-567 1725

WE SUPPLY NEW/REFURBISHED EQUIPMENT IN THE FOLLOWING DATEGORIES



Ruflared Card Punchos. Popor Taps Punch/Variliers Elippy Disc Dasof Data Proparations, Tulotype Lei Vincers Magainties, Tapez Dea System C.D.S. COMMERCIAL DATA SYSTEMS LTD. Bilfericey (02774) 58028 Hollycourt, Billoricay, Eesex

DEC DISC SUPER DEAL

New RK05J delivered and installed with 90-day warranty

RKO5F delivered end installed with 90-day warranty RK11-D (Disc controller) delivered and installed with 90-

day warranty £2,250. All the above equipment can be delivered in 5 days from

PHONE S.K. SYSTEMS 0462 31116

WANTED

TELEX PERIPHERALS D.P.C.E. requires the following:

USED TELEX PERIPHERALS 6420 Tape Unit 6803 Tapa Controllar 5403 Printer and

5322 Disc Orive 4852 Tape Transport 4853 Tapa Controller

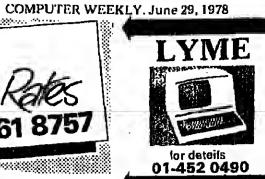
Controller CAN ROD MARSHALL WOKINGHAM (0734) 790703

FOR SALE

PDP-11 System, 4.8 Megabytee, 32K words. All in a 6 foot

Tel: Richard Norson

Ueteprinter/



ELECTRONIC BROKERS LTD SCOOP!

£350

MASSIVE BULK PURCHASE BRINGS YOU HAZELTINE VDU'S AT LOWEST **EVER PRICES**

Teletype Compatible 12 Diagonal Screen TTY Formal Keyboard

64 ASCII Cheracter Set 5 x 7 Dot Matrix Switch-selecteble Transmission Speeds up to 9600

Switch-selectable Parity Standard CCITT V.24 Inter-

UFFERED/EDITING MODEL will direct cuisor

A SMALL SELECTION FROM OUR VAST STOCKS AT BUDGET-**BEATING PRICES**

A\$633 & X8633 TELETYPER. | 14011 E828 | 14011 & 425 | 14111 ALEO AVAILABLE ANILL with special customination of CNLY E678

TEXAS SILENT 700 Term not Mindel 725KSB 110-

DEC BIG SAVINGS ON OUR LARGE STOCKS OF PROCESSORS, PERIPHERALS

AND ADD-ON MEMORY M8 11 Th 105 mile Well 19 Mr C Selvin 11 04 11 (4) **

MF51 UP 12: 4 m it tuen complete with the kilding RIFFLUS 41 40 3 5 45; - Alizze (%) \$ \$1500 MM11-UP 10: 45 worder Compensor to ME11 UT; -NUS (%) \$1380 Holis Orth E1140 OLIS IVER Angus and All the family of the ALEBO RK 10 PAROS Lists II van & Erryste - FROM E4850 RK 00-F Outstrands, Drive - FROM E3850 RK 00-F Outstrands, Drive - FROM E3850 FORTE & POPENS Raines - IRVM E3850 PRICES -- 4X Prices and and TIV Interland -- ShiM E1800 (Add to

Out tiethageant forestan be subplied on request ELECTRONIC BROKERS LIMITED 49-53 Pancras Road, London NW1 2QB.

Tel:O1-837 7781 Telex: 298694

FOR USED DP EQUIPMENT (W)D↓P BUY OR SELL THROUGH

★ PROGRAMMERS ★

* PUNCH OPERATORS *

LEADING SUPPLIERS OF

CONTRACT OPERATIONS

PERSONNEL THROUGHOUT

EUROPE

SAVE TIME AND

MONEY

CALL US FIRST

LONDON

01-493 5736/8

MANCHESTER

061-833 9343

W STREET, LOND

NEW DE LUXE 80 COLUMN HAND PUNCHES (EX-STOCK)



(W)(D)(P)

WEBSTER EL/P SERVICES LTO. 85 WIDMORE ROAD, BROMLEY KENT BRI 3AA

Low-cost version of these peckeges supplied with intel data-J **★ OPERATORS ★**

80 COL. PUNCHCARDS AND COMPUTER LISTING

... Available now at fantastic low prices Phone for samples now.

Or write: D.W. LTD. 98 Wakeman Road, London NW10

Knight is right for contract staff

Knight Computer Services Ltd., 14 Old Park Lane, London W1Y 4NL.



OPERATORS TO PROGRAMMERS TO KEY PUNCH OPERATORS TO KEY UPON

KPG Ltd 28 THE BUTTS BRENTFORD MIDDX 01-568 7345

CONTRACT PROGRAMMERS, OPERATORS, DATA CONTROL KEYPUNCH PERSONNEL SUPPLIED

> Tel: 01-248 6367 COMPUVAC

(Bat 2022 gyalithin daril 79 | 1926 Raiss on regast | IRON 2031 gyalithin April 79 1886 370 125 HOO 256K Februs 4676 4550 4826 470 4567 6246 Februs 4676 4550 Artisale May Price (85.000) 12 32 77/2 aritisals implementally price to

computer services limited CONTRACT or PERMANENT—

RUNDA UPENATORS - DATA CONTROLLERS Tel. 01-487 5781 28A Devotebles Street - London - W

ANALYSTS - PROGRAMMERS - OPERATORS



Contract & Permanent Tecrulation Total DP Support at It basi Programming Operating Data Preparation Systems Data Control Technica Supoppi

Co Operators supply first-rate contract operations staff for long or short term needs

IMMEDIATE DELIVERY OF NEW **PDP II v 03**

Floppy Oisc Sycieme with softwere peckages for STOCK CONTROL PRODUCTION CONTROL LEGGER ANALYSIS

RING **01.836 841**1

Memorex lloppy disc system at prices from £5.000

Deta-J Ltd., 7 Churchill Court, Rustington, Success Tel: 09062-72902

DIRECT WHOLESALE, 01-960 1000

01-491 4706

MANCHESTER/GLAS

HELP

CPU is 1 MEG 18M WITH ALL FEATURES AVAILABILITY SEPT. '78

REASONABLE **BOX NO. 1987**

USED DP EQUIPMENT BUY, SELL, LEASE

Strart Moore Inches ANALYSIS OF

Knowledge of US and Europeen Merkets Write or Telephone JORDAN HALPER **CEDAR COTTAGE** THE DRIVE CHICHESTER, SUSSEX 0243-527 494

CAN YOU HELP!

HONE 01-261 8757

Need urgently schemetics of Olivetti models P603, 770, 730, Prepared to pay

Offers to COMPUTER HARDWARE SERVICE Du Chestollel, 54 2080 Merksem Belglum

SERVICE BUREAU

Providing Batch RJE/TP fact thet for OS and OOS users a

ITEL ASS-3 3072K OS/SVS/HASP VM/CMS

01-242 9283

PDP-11

NEW

PROCESSORS

AND MEMORY

PAP-11/34 with 84 Kbytes memo twin 8X-11 lloppy disks. £12,000.

PDP-11/34A with 256 Kbytes ma (full-upit) C15,800.

PART-EXCHANGE

AVAILABLE

01-836 0355

Are You Selling Micro-Technology?

Then

MICROPROCESSORS

is your answer

As the first European publication in this expanding industry, it offers you the advertiser, a unique sales opportunity to be seen by a potential 20,000 systems ongineers, designers, soft-ware specialists and application specialists in this industry. It onjoys a paid for circulation hence NO WAS-TAGE and more important it reaches your Target Audienco.

For details on advertising ratos forthcoming features and copy dea-

Contact:

LLOYD COLLINS

Telephone: 01-261 8743/8757

Wa can offer genuine OEC core or MOS memory, and plug competible MOS. Let us take your existing OEC core or MOS in exchange for more P.C.M. MOS, or eliternetively, get more DEC core or MOS from us at well under OEC fee price. Example. Expend from 64 Kbgtes to "full-up": 258 Kbytes to under Ex. Doo. Phone us to an instant opotation. If you era interested in a perticular article/speciel Feature or advertisement published in this issue of

PDP-11 INTERFACES

nel line porte evallable al under E200

INTELLIGENT TERMINALS

lue compelible VT-52 but Indorp ting user programmeble 2-60, wij ill graphica £1,450.

OTHER PDP-11 NEEDS?

Mr. Peter Smith. PULSE TRAIN FECHNOLOGY LTD THE Institute of Data Processing and the Data Proceeding Menagement Association have now merged to become the Inetituta of Data Processing Management Ltd. Here the first chairman of the new Inetitute, NEVILLE TAYLOR, enye that there is a membership of neorly 4,000, and he noticipates o growth rata of ot laaat 30 per cent within the first year. He sets out the sime of the Institute and tells how DP personnel

Professional Institute to serve all levels of computer people

stitute of Data Processing and the Data Processing Management Association has now hap-pened. The new body that has emerged is the institute of Data

Processing Management Ltd.
Both DPMA and IDP have esablished a aneeinl position in the computer industry, DPMA being unchallanged as the practical association representing supervisor and management levels, while IDP created an unrivniled examination structure with a strong student membership which could be the DP

management of the future. With increasing nwareness of the changing face of the DP industry, produced by distributed pracessing, mini- and mierocomputers, there is a reul need to recognise the broader basa for recrultment to the IDPM, including user management. necountants, engineers and per-haps the new breed of DP enthuslasts, for whom persoonl computing becomes more than a

mere huhby, IDPM has a membership of nenrly 4,000 and from the pre-sent flow of inquiries it is not unreasonable to expect a growth rate of at least 30% within the

Entrance to IDPM cen be gained either by exemination or by acceptance of persona with the appropriate experience in DP. Thare are two professional grades, those of Membar and Associate, and two intermediate professional grades of Licentiate, for those who have pessed parts I and II of the existing IDP to government and the media; examination syllabus and with

volved talks and negotiations, practical experience, and In addition, there will be an

Affiliate Membership, both individual and corporate. A grade of Fellow may well be established by Invitation of the Executive Council for out-

standing service to the dutu processing profession. The nims of IDPM are: To establish u professionul body to safeguard and enhance

the Interests of its members employed in data processing; To secure and muintain educational standurds for the profession by examination;

■ To secure and maintain professional standards in data processing by promoting the effectiveness and status of those engaged at all levels in data processing, encouraging and assis-ting members to develop their careers within end beyond data processing; enchuraging pruciltioner and management treining and assisting in the provision of professional data processing

education and training facilities; • In provide a forum in which the Interests of duty processing may he discussed and to illanate knowledge thereon;

To inster and maintulu a high standard of professionalism for the data processing manager

To prumote effective communications and links between data processing and ather management functions;

To represent the data procassing industry nationally and to communicate members' views

eficial uses of computers; To publish a journul at lenst

Staff have now been recruited to bandle the administration and sceretarial functions of the institute under the control of a Secretary-tieneral, and will operate from the new headquarters in Henrietta Street, Covent Garden. It is, however, necessary to retain the existing DPMA premises nt 27a York Road, Maldenhead, mail such time us the handover of records, etc, is complete, and all inquirles should be routed via this address

for the time being.
We trust that IDPM will continue to ca-operate with Com-puter Weekly in the way pracilsed by the DPMA in mounting oint workshops, seminars, etc. two recent events which prayed highly successful were the Communication Audit work. shop presented by Nigel Laurie. which proved so pupular that a similar project will be mounted In October of this year, and recently the flourishing Central Laution branch held an enlightesting forum where the operational stuff were given the apportunity to voice their opinions of their manngement. This proved to be extremely lively and provocative, and deservedly nlayed to a nacked house.

In combining the strengths and resources of two of the foremost hadles within the computer industry, the IDPM has provided a professional institute of Data Pracessing Management to serve all levels of those invalved in using computers as an aid to their busi-

Conference

particular techniques for Bystems; Systec Consultants achieving the required layer of and L.R. Taylor of the Danish fault tolerance. In addition, the Atomic Energy Commission.

SDL which elready her ex-tensive in house experience uf high reliability systems through its defence work will also be topping up its team from out-side. Specific expertise in specialised areas is tu ba pro-vided by General Technology

London borough orders 2960

A5 part of a five year plan to \$900,000 systems will be used to develop pulling computer serve intuiting major (inancial and vices for alkits departments, the inviting database systems and

on Very Large Data

THE next international Conterence on Very Large Dala Bases will take place in West Berlin from September 13 to 15. This is the fourth in a series of annual conferences extich have areadly increased in importance and it will be the second time it has been held in Europe.

The conference is intended to identily areas of general inter-est for research, development and application of dalabase; systems. Appropriately it is to be field in parallel with the itiprostional Congress for Data Recessing aportsored by the Berlin fairs builtdrily Some pertial travel prosts we

Some partial travel grants was available to a fudents of comparer subjects and applications about the full better to Dr. Haward Comparer for the Webs, Halter Meitner Institut. Postfach 29 03 28, 1000 Serift. 29 The corrections in stee systems to return of the corrections.

Would you buy a used DP job from this man?

"No, seriously squire, lovely little number. Could be up to five grand year...well, with a little overtime... well, with quite a bit of overtime actually. But anyway, the previous gent was very satisfied, very happy – he's in South America now they tell me, still, this little Catchpole 69/11/2, it's lovely little machine, a real little mover. 'Course, the only system they've actually managed to run on it s the canteen menus, but Rome wasn't built in a day, was it?" Ever had the feeling that the guy trying to sell you into a new DP job would be far more at home selling you a 1963 Vauxhall Cresta? Quite probably he has the same feeling too. Because a lot of people have come into the DP recruitment market convinced they've found an easy way to make a fast back. And a lot of people have been disappointed. At Knight Computer Services, we've never had any such illusions. Because one of

the things our long years in the computer business have taught us is that when you're looking for men and women to do a job and do it well, you can't afford to take

short cuts. So instead of talking you into a job, we'll listen while you talk about the sort of job you want, and why. (If you're going for a seniar jab, we're happy to bend our ears for anything up to an hour.) We'll put a true value on your experience, and a new perspective on your whole career, And because even in the computer husiness, people are still stubbornly individual, we'll get to know you as a person, not just as a list of qualifications and experience. And of course, we'll make sure any job we put your way does things for

So you could find yourself looking for a new car, instead of just another



Knight Computer Services Limited

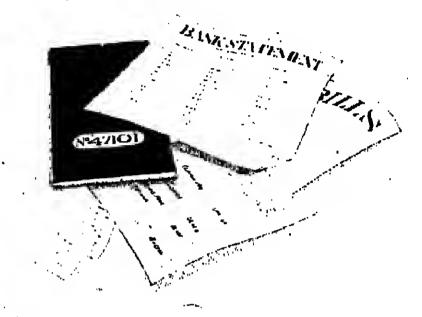
14 Old Park Lane, London WiY 4NL Telephone: 01-491 4706. Please send me an application form:

your kind of jobs.

your kind of people.

ament and Computing Services Association

Is this what's stopping you going in for contract work?



At Knight's we can offer you a little

As one of the largest DP contract staff organisations in Europe, we'll have no trouble nding you your first contract. And for much the same reason we'll be able to find you your second, and third, and soon.

But the most important thing is our reputation for

keeping in contact with people once they've started their contract careers with us. Before the end of a contract starts getting uncomfortably close, you'll get a phone call from us offering you another contract, or, more probably; a choice of contracts. So with us, the end of a contract isn't really the

Your Contract Career Starts Here

Programmer/Analysts Immediate/Forthcoming Assignments

TASKMASTER+COBOL-OS/VS1'SYS. PROG. - Holland London FORTRAN+OS - Holland DOS COBOL - Surrey DOS+OSSYS.PROG.-COBOL+IMS+TSO-Herts.

MVS/SYS, PROG. - Geneva 2904 COBOL - Kent DOS COBOL-London COBOL+G11-London

DRIVER+PLAN-Herts, 2900 CONSULTANT-Lon RSX11 - Italy MACRO11 + RSX11 - Hert FORTRAN+RSX11-Berl

Burroughs Small & Medium

Univac 1100 & 9400 Ops.

Various Contracts

System Ops. Honeywell Level 60 Ops.

ICL Writers GCOS

Terminal Ops.

Please contact Richard Kaluzynski or Sue Gillam on: 01-491 4706 or 01-439 3411.

Operators/Overseas & UK

ICL ...

ICL 2903/4 Ops.

ICL 2960/VME/K Ops.

ICL 2960/DME Ops.

IBM 360/3/0 DOS GRASP Ops

158 OS/VS2 Ops. IBM 370-OS VS1& HASP Ops. ICL System 4/72 & 50

IBM Data 100 JBM System 3 & 32 Ops.

ICL 2980/VME/B Ops. ;ICL 1900 G11, 11+ & 111 Ops. For further details or advice call Sue Smyth, June Mogg or Jane Asbury NOW! on 01-491 47

All vacancies are open to both male and female applicants.

The first of the first of the state of the s

Knight Computer Services Limited. 14 Old Park Lane, London W1Y 4NL. Staff Services Division of BOC Datasolve Group and **\$6** a member of Computing Services Association.

COMPUTER WEEKLY why not take advantage of our reprint service: Reprinte can be secured et reesonable cost to your own specifications providing an attractive and valueble eddition to your promotional material: [Minimum .order 250) .

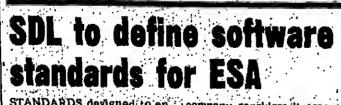
Compeny

For further datails contact: Brien Bannister, IPC Electrical-Electronic Prese Ltd. Phone: 01-261 B046 or simply complete and feturn the form below.

To: Grian Bannister, Reprints Department Dorset House, Stamford Street, Landon, SE1 9LU i am interested in . copies of the orticie/

featured in COMPUTER WEEKLY

on page(s) in the lesue dated Please send me full details of your reprint service by return of post



defined by Systems Dealgners ever possible on the use of com-Ltd under a contract from the puter aids for program European Space Agency. The specification, design, and contract, worth £50,000, and ex-implementation. nanned space missions.

Rellable end fault-tolerant software is vital in such applica-tions, where the scope for fault rectification is limited. This is particularly true for deep space missions, which may be beyond tha range of ground control.

A significant aspect of SDL's work will be the identification of

STANDARDS designed to en company considers it essential sure software quality ere to be: that standards are based where

Sciences SDS system developed for RRE (CW, March 29, 1973),



Terminal Sales Executive

over £10,000 on quota plus car Our client is a well known terminal manufocturer in the United States with an established aperation in this country. Due to continued growth they wish to expand their sales force and are looking for a person with o proven ubility in the terminol or computer services market. The headquarters of the UK company is southwest of London but the territory to he allucated will be in the City. This is on excellent apportunity for a capable sales executive as an early promotion can be expected. Sulary and fringe benefits ore above average.

Systems Support Manager

to £9,000 + car

A major computer manufacturer with interests in o broad spectrum of industry wish to strengthen their managemont team by appointing a Support Manager with total responsibility for the systems support department. The auccessful candidate will ideally possess an extensive software and hardware bockground with a proven record of managing a similar group. The compony offers extremely rewarding and atimulating work, involving a lugh degree of personal contact at all levels. Essential qualities of the appointee will be the obility to communicate ideas and have an inherent positive and diplomotic personality. Contact: Jim Baker

Lecturer

W. of London

Our client, an established d.p. equipment manufacturer with worldwide markets, wish to appoint an experienced softwore lecturer. The total work will include training both in-house technical staff and support analysts as well as porsonnel from new and existing enstamers. The appointee will be responsible for research, preporution and delivery

Applicants should have a aubstantial track record in teaching or training with an emphasia on software, particularly mini ASSEMBLER, and of least one other high level language. An overall knowledge of the d.p. industry is very desirable and the ability to handle people and pressure is

Great job for a career minded, self-motivated person. Contact: Mike Creamer

A small, but rapidly expanding, systems house has a requirement for a Project Leader to set up a team tradesign and implement a sophisticated reservation system using a Honeywell Level Ganini-computer. Cambidates must have experience of designing commercial on line systems on ministral large a background of high-level languages. Ability tir minage a small team and motivate staff is resential.

c. £7.00H - £8.000

This is a real appartunity to grow with the Company and career prospects ore excellent. Confuel: Jim Baker

Systems Analysts

Project Leader

London/possible overseas travei starting up to £7,510 A major systems devolopment project, involving a large database and teleprocessing network, is commencing with a leading international company. The team is being formed and vacancies still exist for Analysis with a broad commercial applications or systems background on any type

It is highly probable that, as the staffing level expands into the project, original team mombers will progress into senior positions with correspandingly high salariea and reaponsibility (marylar in Europe). This is perhaps one of the most exciting projects being started in the U.K. Exceptional opportunity to get involved, maybe for the first time, in large datobose development work. Contact: Mike Creamer

Support Programmer

This client, a leading insurance Company, is presently running I wall.

System 4/52's alongside o new 2060 under DME and VME-B. They require an Assembler level progrommer with at least 3 years' experience, prefembly with n I operationa systems linekground, in provide their operation department with technical support.

This company's future computing needs will be 2000 based, so this is an excellent apportunity to get in on the ground floor and gain valuable New Range experience.

Good career opportunities exist for those with drive and ambition Contact: Andy Wright

For further information on any of the above vacancies please contact the appropriate consultant.

If your qualifications do not match the above positions but you are seeking other opportunities please contact us anyway.

JAMES BAKER ASSOCIATES, International Personnel Consultants 16 Maddox Street, London W.1. Tel: 01-491 4478

RPGII Programmer/Analyst

For permanent position in Cologne, West Germany Salary package from £11,000 p.a. Full relocation expenses provided

One of the world's leading menufecturers of ultra-sonic equipment has asked us to recruit en experienced Programmer/Analyst to join their installation in Cologne, West Germany.

An IBM System 3/15B has recently been installed and they are now at the very early stages of developing integreted manufacturing and costing systems.

We would be most interested in meeting you if you have obtained sound experience of RPGI and knowledge of systems analysis and design.

Although technical ability is of prime importance, you will elso be expected to liaise et user level and therefore, a good working knowledge of German is necessary.

K you are looking for cereer development, then this will be a very positive step in the right direction as our client encourages everyone to realise their own potential both in and out of deta processing.

For further information please contact Marilyn Black

Computing Services Association

WE ARE ALWAYS INTERESTED IN HELPING YOU WITH YOUR CAREER John Goldsmith (Computer Recruitment) Ltd., 15, Buckingham Palace Road, London, S.W.1.
Tel: 01-828 5356-24 hour answerphone service.

JOHN GOLDSMITH (Computer Recruitment) Ltd.

ABR YOU GRINNG ENGINES

★ JOB SATISFACTION

Full harrking honolits including aubsidised mortgage

* Excellent working environment * Lile assurence. 6UPA. LVs and 4 weeks' hols.

★ SALARY

★ CAREER OPPORTUNITY

SYSTEMS ANALYST

Excellent working environme

Joh security with prestige concern
 Salary £7.500

* Discount on all company products * Salary to £5,000

One claim), a prostigions Meichent Bankata are sacking a systems analyst who has linancial/banking environment experience. (Trey rotein IBM 370 under OS but will consider other heidware experience. Co.

ICL PROGRAMMERS Our client, a major and successful publishers retaining ICL I 901 seeks proficient COSOL programmors with one year plus experience and desire to strengthen their programming knowledge. Successful applicant will join a progressive OP team and be immediately involved in a variety of projects. Co. offers # FLEXITIME

* Exciting and interesting on-going end luture devotopment work

* Gararous frings benefits including pension/sicknoss schomes

* Overtime if required

* Salery to £5,000

PL/1 PROGRAMMERS **W. LONGON AREAS**

As part of a prestigs international group of companies, our client is now recruiting for programmers with 2/3 years' PL/1 expanience and hopsfully some ASSEMBLER for the development of manufacturing systems on the IBM Series 1 mini computer

* Excallent opportunity to be trained on mini computer * Versatility of IBM Series I — relation to IBM maintrame

Working with up-to-date tachnology
 Excallant career opportunities including chance of working with microcomputer

MINI PROGS

REF. 1611

REF. 1597

Our client, a wall established financial group, is setting up a new company to deal with a repidly expanding srea. This is a super opportunity for progs with exparience on any mini hardware. BASIC would be an advantage but they will train on their own new language. If you went a CHALLENGE and to be involved right from the beginning phone NOW. Co. offers **NCR PROGS** C. LONDON Major loisure group with turnover in excess of £200m seeks 2 COBOL programmers with approx. 2 years experience to supplement their successful and professional programming let

Ideal opportunity for going on to analyst work Wide range of applications
 Accounting and other business systems
 Salnry to £6,500 p.e.

Backing perks, free life ossurance and LVs
 Salary £6,000

'REF. 1622

REF, 1493

IBM PROGRAMMERS

International concern dealing in UK and Oversass has large IBM 370 herdwere supporting an extensive TP tretwork. Currently emberking on a wide range of new development projects, they wish to supplement their existing from with COBOL programmors with MINIMUM 12 MONTHS' expandence.

* First-class coroor in deta-processing with long-term prospects

* Excellent training and possibility of learning other language

* Excellent bronoists include relocation sesistence, non-contributory pension, STLS, LVs and Parsonal

HONEYWELL ANALYST PROGRAMMER LONDON

Mountacturing company producing a wide range of household goods is seeking an analyst programmer with at least 2 years' COBOL experience. The successful applicant will join a professional and enthusiastic

earn utilising Honeywall mainframa and preferably had GCOS experience. Co. offers

toen scheme . * Selary £5,000 p.o.

SNR. ANALYST/PROG

W. LONDON

International company with outstanding reputation for afficiency, growth and investment are seeking senter analysis programmers to work within IBM 370 installation. Good experience of PL/1 or COBOL or ASSEMBLER is essential together with ability to work on own initiative and supervise staff. Working on ASSEMBLER IS essential together with ability to work on small bust teleprocessing and time sharing systems with opportunity to work on small bust Excellent promotional prospects

* Non-contributory life Ass., sickness and penalon schams

For details of the above positions or any of the many others we have on our books-

CONTRACT

Telephone or write to our London office 91-734 0152/3010 24hrs.

OVERSEAS

UNIVAC + OMS DATABASE BURROUGHS COBOL + OMS OATABASE CIGS COBOL DOS VS FORTRAN TECHNICAL APP MINI EXP. PREF. DATAGRAPHICS SPECIALIST SYSTEMS ANALYSTS BURROUGHS

ICL GERMAN SPEAKING

HOLLAND £400 p.w. HOLLANO £400 p.w. HOLLANO £400 p.w. BELGIUM HOLLANO . £400 + p.W. £425 p.w. £200 + full exp.

IMS COBOL PROGRAMMERS AN/PROGS IMS COBOL POP II ASS OR MACRO !! ICL GII COBOL IBM OS COBOL CICS ASSEMBLER IBM OS COBOL

£230 p.w. £230 p.w. HERTS £180 p.w. £200 p.w. £230 p.w. £180 p.w.



Phone now for immediate and future contracts Ring Christine Kay / David Hayton 734 0152 (24 hrs.)

WEFILES AMSTERDAM PARIS MANCHESTER



You will be bosed at our ellent's expanding No. London data centre where mainframe and misi computers thak Group activities with a sophisticated cummunications network. You will gain intal systems experience, with the unusual opportunity of developing extremely diverse business systems.

CENTRAL COMPUTER

Caodidates with several years commercial experience using any language should apply for further information.

The majority of products are monufactured at two factories where computer systems are required to monitor requirements; work-in-progress; and raw majorials usage and productivity.

WAREHOUSING On-line computer systems will enable maximum usage of warehousing space and control allocation of products to outlets.

DISTRIBUTION With over 45 outlets in the UK and 15 in other countries in Europe efficient distribution of fast moving lines is essential and systems to provide positive control are of paramount importance.

Awareness of dalty fluctuations in deniand enables positive control of stocks, provides customers with a first-class service and management with instant performance measures.

MYRIAD APPOINTMENTS LIMITED Computer Personnel Consultants Telephone or write to:-30 Fleet Street London EC4Y IAA 01-353 0981 (24 hrs)

The big name

in small computers

Weng UK, the testest growing subsidiery of the mejor American computer menufecturer require:

SENIOR FIELD ENGINEERS AND FIELD ENGINEERS

in the Herta/Essex, Middlesex/Berks, and Devon/Somerset areas.

Applicants should be qualified to et least ONC or possibly HNC in electronice, or with relevant experience in field meintenence of computers end

Highly competitive salaries will be offered in addition to usual fringe benefits, plus e company car or cer ellowence.

For further information write giving a briaf resumé ol your career to date to Barria Millatt, Wang Electronics Ltd., Argyla Housa, Joel Straet, Northwood Hills, Middlesex HA1 1NS, or phone him at Uxbridge 52195.

NEAT/3 **PROGRAMMER**

Applications are invited from mature and capable program-mers with at least two years' experience to join our Data Processing Department. A knowledge of on-line application end of LEVEL 2 would be advantageous as the Society plans to develop a commitmications network with the acquisition : of a Criterion 8450, exhabited for delivery in September! The Society offers en exciting career to epplicants who are prepared to work on their own initiality and society responsibility. The position provides an attractive salary attractive, concessionary mortgage fabilities and free embership of BUPA,

In the first instance applicants should write giving details of educational background, career history and current salary



Computer Services Mariagor (Staff Appointments) Birmingham Bullding Sectory 42 Watering Birbet Birmingham, 82 508

Senior Programmer

Our Client, a major and widespread industrial organisation, has an opportunity which it outlines in these

Nationwide, 100+ Analysis and Programmers are producing a new generation of teleprocessing systems using our private switched network. This links three large IBM mainframes to each other and to a host of plug compatible terminals in our production locations throughout the UK.

Development teams are distributed, and each has install access to all three production bureaux via its own terminals, with responsibility to Install its systems across the country.

One team, developing on-line transaction processing accounting systems using Total/Environ, is in arrient need of a Senior Programmer having thorough IBM knowledge.

Experience of database/driving software would be

We will pay you a salary according to ability and experience, and assist in relocation exponees. The location is in pleasant farming countryelde, and private housing is plentiful and inexpensive by national standards.

Please write in the first instance, enclosing details, to the address below. (Reference 768 must be quoted on your envelope. Enclose separately a note of any companies to which your application should not be sent.)

Ronald Felrbairn, Evaretts Recruitment 10 Greycoat Place, London SW1P 1SE

EVERETTS recruitment

COATI IND

Young, personable Systems Analysi / Programmer, reedy to grow with an expanding Software Group which is shortly opening an office in Scotland to service its developing user bees.

WE OFFER - Variety of Machines and Applications Scope for initiative Never e dull momen

Candidate should preferably testde in Central Scotland.

or more informetion or application form contact. David Fisher - 0422 58231



SOFTWARELTD QUEENS ROAD HALIFAX HX13LR

KBS COMPUTER SERVICES KBS

You need top quality staff.... and you need them fast!

Would you like them at no cost to you?

KBS Computer Services from staff to exacting standards. When students have our concess we estimate they have quited the equivalent of 18 months communial experience and neconseguence Operators, Programmers and Analysts can be put straight to work with minimal hirther

The following billy trained personnel will soon. he ready for no cost placement.

PROGRAMMERS

Cobol, PL/I or Assombler (available hime & July)

COMPUTER OPERATORS

Systems analysts

If you would like for ther details contact Mr Les-Brown, Placement Manager at



KBS Computer Services, State Insurance Building, 14 Dale Street, Uncerpinal 1,2 4 Till. Telophuna - 051-236 9710

COBOL

f you are arrestnerous out Cliffort programmes and have writed with BM370 computers your ould halo of to devotoe the commercial and project management systems to power tro ment the demaints of the new programme of unclear power station design and construction

We offer excellent confidence of employment inclinating contributory pension scheme, canteen, rupurs and social club and generous relocation costewing appropriate.

If you are interested in joining our small but high quality programming team, please telephone or write for an application form, quoting CW6, to

MR. C.J.A. UNDERHILL. NUCLEAR POWER COMPANY (RISLEY) LTD,

WARRINGTON ROAD, RISLEY. WARRINGTON, CHESHIRE. TELEPHONE WARRINGTON 51281 EXTENSION 337



NUCLEAR POWER COMPANY LTD.

SYSTEMS ANALYSTS ANALYSTS OF STREET

CAPITAL APPIS GRADUATER G was 60 01 806 3883 @ GV2555/407 (14 1455)

F

JOBS IN LONDON AND THE HOME COUNTIES

IBM 370/138 DOS/VS,CICS You should have mound 1 years' expenence. The Company operate a two shall system, and ofter some very generous benefits and sulid crima prospects.

PDP 11/70: DEC 10

£4700

ICL 1900 GII

You'll need 16 months' experience for this City based job which offers 4 weeks' hole (this years honoured) a slet

£4000

ICL 2904 (2900 or 1900 EXPERIENCE)

This could be your opportunity to progress into progrem-ming! Excellent perks include generous holldays and o season ticker him. You'll need 1 year + experience.

HONEYWELL OPERATOR

GCOS It's a two shift system, and parks include 4 weeks hals, a senson ticket loop and programming prospects.

traineesi if you have 'o' levels, we want to Hear from you today, the same goes FOR DATA CONTROLLERS. FOR THE BEST JOBS IN ALL AREAS, RING STAFFSCENE - OR POP IN FOR A COFFEE AND A CHAT.

COMPUTER RECRUITMENT 01-353 6931 9 ST. BRIDE ST., LONDON EC4



Experienced **Operators**

rocuiou — riverboor Applicants should have at least 18

months experience of DOS/VS using Power. Wapresently operate a three shift system incorporating weekends, for which we puy an attractive shift premium.

Computing is based upon an IBM 370/138, 512K machine running under DOS/VS with over 100 local and remote V.D.U. terminals under

We offer attractive salaries together with excellent conditions of

Apply in writing, giving full curser details to:

PERSONNEL MANAGER. VERNONS ORGANISATION LIMITED. VERMAIL HOUSE. ORMSKIRK ROAD.

LIVERPOOL LSS 1AA.

occ computer personnel limited

to £8000

to £7000

Software House -- Commercial Systems

An expanding softwere house established in 1972 and with an impressive client base throughout London and the South East, currently requires additional experienced staff to work on a number of new projects. The Company offers attractive salenas together with profit share and trevelling expenses. As a consultancy, it provides a young and friendly working etmosphere and the ideal environment in which to gein experience of working on a variety of machines, applications and

Wini Applications Division

Amersham and City based

Progremmers are required at all levels to work on mini computer projects. Applications are mainly accounting systems end primarily on Hewlett Peckard, Date General or DEC equipment. Development is either carried out at the client installation or in-house at Amersham. One particular requirement is for COBOLor FORTRAN experience preferably on Hewlett Peckerd or Dete General equipment, but experience on other commercial mini systems will be considered. The easential requirements in all ceses are two years' experience in a real-time multiprogramming environment on commercial mini based systems and the ability to contribute significantly to the division's growing technical expertise.

Wainframe Division

London & Home Counties

Analysts and Programmers are needed to work on the full range of commercial applications from small batch projects through to lerge on-line detebese systems. The mejority of consultancy work is cerried out by smell teems based at customer instelletions throughout London and the Home Counties. Candidates must therefore be prepared to work in end around London for which travel expenses will be peld. Systems personnel should have a broad systems and progremming beckground within the commercial erea end must have the parsonelity suited to working within a customer environment together with the potential lowork in e teem leadership capecity. For programming applicants, PL/1 is of perticular interest but COBOL, Assembler or Merk IV on any mainframe will be considered (re-training on IBM given). Any specialist knowledge such as CICS or IMS would be of particular value.

To apply for these positions or for further information please call Sharon Matthews on 01-242 9356 (office hours) or Bittericay (02774) 22351 (eveninge/weekende) or write to the above address quoting reference 450/CW/SM.



Programmersbreathe some fresh air and work in the country

As a result of the success of our enetration in the field of mioicomputers and business systems, we are expanding our software support service. We are therefore looking for Programmers who ideally have had at least two years' experience on.

nufacturer or USEC . We can offer experience in a wide variety of applications and also direct nyolvenient with our customers. You will

commercial minis or VRC's with a

be based of our attractive Training Centre in the heart of the Surrey countryside Salary is dependent u pon experience and includes a geoerous car allowance.

To lind our more about this and our of company benefits please write to or telephone: Tony Nicholla, British Olivetti Ltd., Branksome Hilders, Hindhead Road,

olivetti

Knight is right for contract staff Knight Computer Seivices

14 Old Park Lane London W1Y 4NL 17711 01-491 4706

or MOC Develor Gridup and a marrie SR of Companies America Association

C8.000 per annum. Mastinge arranged en ime, anywhera 01-505 5576 (24 hours)

RPG II/BASIC for contract staff I am looking for people with 18 months plus lor varied end well paid per manent work up to Knight Computer Services 14 Old Perk Jane." London WIY 4NL

Spirit Servicia Directori

Knight is right

Corporation of London Guildhall, E.C.2

PROGRAMMER

(Salary review July 1978)

The Corporation of London is seeking a Programmer to a sarm of five other programmers in its Installation while responsible for a wide range of financial, and non-finan systems. For example, Integrated Accounting System, I and Rent Collecting System, Stores, School Fees; Payor etc., together with Treffic Tickets, Register of Electors Examination System, etc.

The successful candidate should have 18 months of CO or PLAN programming experience and will be girn-house training and further external training as necessary the general environment is such that a broad base experies can be obtained from the installation. Soth CO and PLAN languages are used.

The salaries are inclusive of a salary supplement of ES special supplement. £47.7 and the '5% Phase II as adjustment, and will be commensurate with experie Annual increments are then granted up to the scale in Other benefits include generous holidays, suparannus scheme, season ticket advances, subsidised stall restay and restayment advances in annual cases.

and resettlement advances in approved cases. The installation comprises on ICL 1902S 48K store pro-sor, 3EOS, 4 tape pecks, alc. and GEORGE 2 opera

Applications with derails of working experience.
Academic peases, or enquiries, are invited and should addressed to.

Computer Services Manager Guildhall, London, EC2P 2FJ

ال المدمة أناخ فوصاية منها والعاشرية المناطة والوثاة وتنداه الدرارة الد

Four to five yours surcrossful selling oil business systems, VRCs, terminals oil bureau services in required for these vacancies. The successful applicants may wad in Landon, Midlands, Hampstone on Sussex. £7K+bonue+exs SYSTEMS PROG. London

An expanding software house requires expenenced OS programmers.

168 Finchley Road, London, NW3 6HP

partition of the second second second The state of the s CONTRACTOR

datascene

CONTRACTS

LONDON U.K. **EUROPE**

TWO MONTHS TO TWO YEARS GOOD RATES + BONUS IMMEDIATE STARTS

CALL

BOB EDWARDS

Datascene Recruitment Limited Sceptre House 169-173 Repent Street London Will 7F8 01-439 1856 24hour answer phone

HP Bulmer

Systems Analyst

a Systems Analyst based at their head office in Hereford.

Applications are invited from people, who possess sound. iege. In addition, it is desirable for a to have had experience creating models in financial and other

spheres.
An occellent salary together with an ottractive benefits package is offered, including a non-contributory pension scheme and free life assurance Assistance with relocation expenses will

be given if required.
Applicants should apply in writing to
Mr. A. R. Tough, Persoonel Officer, H PBulmer Limited,
Ryelands Street, Hereford HR4 9LE.

Bulmers. Cider. and a lot more besides

COMPUTER PERSONNEL APPOINTMENTS LTD. Career Opecialists and Consultents for D.P.MANAGERS, SYSTEMS ANALYSTS, PROGRAMMERS AND

Sands, Northern Counties and Scotland Con For application forms apply to: 65 New Street, Strmingham 82 40U, 021-643 0961 or fel 01-723 6334

Software for Avionics Systems

CHELTENHAM

The Aviation Division of Smiths Industries has a heavy commitment in programmed avionic equipment now essential to the operation of modern high-speed aircraft, both military and civil.

So we are rapidly expanding our software activity to develop e variety of applications employing the most advanced systems

These positions will attract specialists at various levels up to senior, with several years' relevant practical experience and a degree or equivalent in electronics, computer science, mathematics or other related subject. This includes newly-qualified graduates eiming for top-position experience.

You would work with small project teams, have computer access and considerable responsibility for your part of the softwere.

Real-time Airborne Software

Here you would design and program airbome mini and micro-computers for cockpit displey, weepons guidance and flight control. A high level of job satisfaction—through direct contribution to eircraft performance and customer liaison—is assured.

Support Software

backs the equipment activity with the design production. adaptation and maintenence of compilers, assemblers, interpreters and design/analysis/documentation tools for airborne computer programming-including the support of a growing range of

We offer attractive starting salaries, plus the full range of benefits customary in a major international organisation-including relocation assistance to this pleasing area of the Cotswolds.

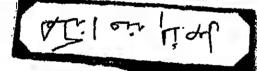
If you are seeking edvancement in a growth activity write to:



H. Upson, Assistant Personnel Manager, SMITHS INDUSTRIES LIMITED

AVIATION DIVISION

Bishops Cleeve, Cheltenham, Glos, GL92 4SF.



SOFTWARE ENGINEERS

South Coast

up to £6,000 plus full re-location

Our client, an International leader in communications and control technology, is looking for Software Engineers to work on any of the ioilowing;•

PDP11 MACRO CORAL ASSEMBLER RSX11M FORTRAN

If you have experience in any of the above and would like to start a new life in a beautiful part of Dorset then why not ring John Davey on 01-581-1830 or 01-584-8476 or write Thurlog Executive, 30 Thurlog Place, London, SW7 2HQ quoting, ref. PCL/8. (Consultants Nationwide)

> Thurloe Executive
> 30 Thurlos Place, London SW7-2HO Telephone 01-584,8476

PLACEO BY THURLOE ADVERTISING



UNIVERSITY OF ABERDEEN COMPUTING CENTRE

The University has recordly metalled a large Honeywell rimit processor 66/80 system supporting a large terminal network Applications are invited for the following positions

1. Information Officer

To take charge of the preparation must distribution of information for users of the system. Applicants should be groduates with several years: experience of non-of-relation modern computing system and proformity with experience of using computers in a University or human environment.

Systems Programmers

To join the cystoms group which is concurred with the support and development at the subwate Applicants shared normally have a good from the subwate and some years at relevant experience. Preference will be given be applicants with apparence other of continuous dates software or of the development of microprocessor applications.

3. Systems Engineer

To be responsible for the contint and development of the targe communications systems within the University Applicants chould have an electronics qualifaction and

Selary in each case on scale C3,800-C6,178 per onnum [Granta IA Other Related Staff] with appropriate placing.

Further particulars for all posts from The Secretary, The University, Abardeen, with whom applications 12 copies) should be lodged by 28 July, 1978



CITY OF BIRMINGHAM POLYTECHNIC DEPARTMENT OF COMPUTER STUDIES

BRITISH COMPUTER SOCIETY PROFESSIONAL EXAMINATION

PART I AND PART II emination leading to

HIGHER NATIONAL DIPLOMA IN COMPUTER STUDIES

Further details can be obtained find the equipposite Courte Furth Depositioner of Computer Studies and Mathemotics, Franchish Steel Pony Bari. Bulungham B47 Computer Studies and Mi 25U Tel-No U21-356 8911

Application forms by the HVO Course available from City of Pirmingham Polytechnia, Admissions Paction (CS), Corporation Street, Birmingham 84 70%.

POLITECHNIG CYMBU **COMPUTER CENTRE**

inplications are invited from graduates or similarly qualitied applicants for the following posts to work on the new OEC System.

SENIOR SYSTEMS PROGRAMMER

Belary £4,343,68c
£4,635,36p includive of
supplements
The person supplements
The person supplements
and a seam ongayed upon the
design, implementation ins
maintenance of Systems 6-15 maintenance of Systems Golt-wars Applicants should lave lied appearace of meditying system

LIAISON OFFICER/ PROGRAM LIBRARIAN

tery £3,861.90m-£4,616.85p inclusive of

ta,c1c.35p inclusive of supplements

The person oppointed will be responsible for providing support to a vertey of educational users. Applicants should have had substanted computing experience preferably in an educational establishment.

Jocal Ogvernment Conditions of Service apply.

Please enclose large a a a for details evallable from The Personnel Officer, The Polytechnic of Weles, PORTY-PRIDD, Mild Glemorgen, Tel: (0443) 406133. Closing date: 17th July, 1878.



Programmers Contract & Permanant TEL 0565 4925 TODAY!

3000000000 PREELANCE O PROGRAMMERS. 2140 to \$400 p.w.

UK & OVERSEAS 41 WE 01 995 3883 🚨 PREEPOST LONDON WE 38H. 3730 *************

SOUTH WEST WATER AUTHORITY

Directorate of Resource Planning

Technica Assistant Statistics (Malo or Female)

GRADE 1 (£1290-£2343 or 2 (£2442-2745) or 3 (£2550-£3186) plus £312 p.s. salery supplement et ago 18 and limited 5% supplement (Phase 2).

This appointment is likely to be in the upper part of the one year's experience of stetistics and the computer processing of sample date Applicants should be skilled Fortran programmers and be capable of developing eletretreet techniques and

Technical Assistant Temporary

[Mela or Female] GRADE 1 (£1290-£2345)
or 2 (£2442-£2746) plus £312 p.s. salary supplement at see 18: and limited 5%

> An eppointment which for the present is considerate temporary until Merch 31 1979, is elso available in 19. 1979, is elso available in
>
> the Statistice Section of the
> Oirectorate of Resource
> Plenning. Computer pregramming and data head
> ing are the main tasks and
> the holder of this post will
> be trained as required to
> undertake the work. A. graduate in a seconical field would be preferred for this

Application forms may be a partial from the Permonal Difficer, 3-5 Bernfield Roed, Exercy EX1
TRE (Tel. Exercy 50891). to whom all applications a should be returned by 2.13th July, 1978

Principal Technical Programmer up to £7,000 p.a.

We are a thriving new company now becoming a recognised force in the computer industry (and with the backing of CDC, NCR and ICL). Our labs ere purpose-equipped for stete-of-the-art development of computer peripherels. Our current development includes an advanced magnetic tepe system.

This senior member of our technical software group will:

- teke a key role in developing software for testing our high speed computer peripherals:
- be expected to make a mejor contribution to the technical planning and design of future software suites.

An extensive knowledge of programming mini-computers at assembler level for technical epplications is required, together with an understanding of the hardware aspects of interfecing. (Date General Nova 3 computer experience is desirable). Experience in the design concepts and progremming of microprocessor-based systems would be en edvantage.

given to fresh greduetes who can

delined system prob

masicultoe bag evilative and enthusiasm

together with a desire to apply advenced anulational techniques to the solution of

The salary will be within the following range

£3514 p.a. - £7101 p.e. point of entry will be

Applications in writing giving full details of

position and salary should be forwarded to

North Eastern Region, Bockwith Knowle, Otloy Road,

Herrogolo, to arrive not later than

Central Electricity Generaling Board,

Pleaso quote reference 8VN/472/CW

ono, qualificatione, experienco, present

Monday 17 July 1978.

dependent upon age, quolifications and

Talephona Morris Chudleigh on Stavenage (0438) 66561, or write to (or phone for an application form): Mrs. Rhiannon Chapman, Personnal Managar, CPI Data Paripharals Limited, Bessamer Drive, Stevenage, Herts

REALTIME SOFTWARE

Cantrel Electricity Ganarating Board - North Eastern Region

A vacancy has arisen for a Research Officer

in the Control and Instrumentation Division

of the Scientific Services Department based

The successful candidate will join e group

tuno system software for hierarchical

distributed micro and intri contputer

nyalonia, lo bo used for on fine deta

Applicants, male in founds, should

CORAL 68 is ossential and terriflority

with PDP t I and An TMS 9900 systum

alestation expensers a with multi-

providence systems work would be

aftwarm is destrated, whilst

preferably both firm twentes and have o

good degree in normputing acconce or.) ., equivalent qualifications. Experience with

MID GLAMORGAN COUNTY

COUNCIL

County Tressurer's Department

SENIOR SYSTEMS

ANALYST

(Systems Programming Team)
SENIOR SYSTEMS

ANALYST

(Technical Project Team)

Salaries £4,759.56.£5.512.56, inclusive of nationally

asperance.

The Authority currently operates an ICL 19045 computer and is now actively planning for the introduction of a large ICL 2900 computer text year. The post within the Systems Programming Team will imply all aspects of the implementation and maintenance of the VME/B operating system and utilities, together with the provision of technical support where appropriate. The post within the Technical Team involves responsibility for the disvelociment of systems and the implementation of

for the development of systems and the implementation of

or the development of systems and the implementation of itschnical software matrix lof Planning. Architect's and Surveyor's Departments within the County Council, The team is also respondite for a large examination processing system developed on behalf of the Welsh Joint Education Control to a

A minimum of two years systems' experience, preferably of a system programming or technical nature, as approprieta, and a relevant degree or recognised qualification are

The County Council's scheme for the payment of lodging and disturbance allowances and ramovel aspenses will

Application forms to be returned by 14/7/78) are obtain-able from the County Treasurer. Mid Glamorgan County Council, County Hall, Cardiff.

essential for both posts.
A flexible working hours scheme is currently operating

apply Hational Conditions of Service

Carriesing will disqually.

aled supplements and subject to further review in

which is actively engaged in developing teal

quietton, display, monitoring and control



CPI Data Peripherals Limited

UNIVERSITY

COMPUTING

ECOURTS

COMPUTER OPERATOR

REQUIRED

South London-up to £3,800

A vacancy exists for an operator with at teast 6

equipment. The successful applicant will be able to develop their experience working a

2-shift system on en NCR Criterion N-8570

operating under B3. Here is an opportunity to join a small team in a fast-developing inetallation with the prospect of transferring to programming at a leter dete. Further details from the Computer Services Manager:

COURTS COMPUTER SERVICES

4th Floor, Crown House, Morden Burrey SM4 5ED, Tel: 01-540 4591

LEARN THE PDP-11

We require assembly language programmers to work . PDP-11 systems software. In house development machine.

PBP-11 experience NOT required

CONTRACT/PERMANENT

JHDP LTD.

99-101 Regent Street London, W.1

01-734 3027

NCR CENTURY OR CRITERION

MANAGER

An international underwaar menufacturing and distribution company making girl shaped girls, hes to be mindful of the changes in feshion. However, the business foundation of the company is obviously a serious metter, and the development of a European systems network based on a Honeywell 64/30 is going to be a prominent losture in their plans. They require two experienced Systems Analysts to put this network into action.

that staff appointment will be made at 0 salary within the tango E6054-E7308 per serious on trade il of the palary scales for Other Release Serie, with initial plantment dependent on age.

formition particulars may be obtained from the Secretary of the University Court (Room 18). The University of Jesgow. Orangow 0.12 900. with whom applications (8 caples) giving the names and addresses of three referes, about be ledged on or before 31st July 1879.

roply please quale Ref. No 4179P.

Senior Systems Analyst

Reporting to the Director of Systems Consultancy, you will study key functional areas (particularly production control/planning and inventory management), enelyse business problems and implement improvement plans. You will be supported by enother Systems Analyst and lieles with departmental managers and computer usors. Aged 30-40, you will have at Jesst 5 years business systems experience in a manufacturing industry and preferably a background of some & M or work study/mailhods analysts.

Systems Analyst

salaries.

Working under the Senior Systems Analyst, you will assist in the study of business problems and implement new systems and improvement plans. You will work closely with other departmental managers and computer users. Aged 26-35, you will have at least 3 years business systems experience in a manufacturing industry and some O & M or work / matter

in addition to negatieble seleties, both positions will involve travel in Europe and excellent opportunities to develop your careor within the Company.



Pieces telephono or write for details to, Graham Besmes or Mevis Webster on Chelmsford (0246) 60234. PER, Ceter House, 48 High Street, Chelmsford CM1 1DE.

COMPUTER WEEKLY, June 29, 1978

OPERATORS

CONTRACT and PERMANENT

We want YOU now for Permanent

Positions at all operational levels,

Contract Assignments with a

various locations, main frames and

minimum £100 p.w. plus expenses.

Vacancies exist in all parts of U.K.

D.P. RECRUITMENT LTD.

KENT HOUSE, 87 REGENT STREET, LONDON W1R 7HÉ

TEL: 01-437 2062 3 4 (24-HOUR ANSAPHONE)

Re-Shape Your Career

For further information contact:-

Applications from both men and women are welcoms

CAMBRIOGE UNIVERSITY LIBRARY LIBRARY AUTOMATION SENIOR

VACANCIES

Two serior vecancies, give on scale (6.506 to E7.782, the other on ecole 14.801 to (5.782, the other of the other other of the other of the other other other of the other ot

Knight is right for contract staff

Knight Computer Services

14 Old Park Lane. Loridon W 17 4NL
Record Control O1-491 4706

Buff Services Division
of BOC Discessive Group and a member
84 of Completing Services Association BOROUGH OF BROXBOURNE

ANALYST/PROGRAMMER

South West Essex

(Grade SO.2 - Maximum £5,692 p.e.)

This post ranks accord to the Computer Manage The installation comprises an ICL 28K 2903/3 with 3 EDS 30, Megnetic Tepe, VDUs, Hard Cor Printers and D.D.E.s. Further enhancements a envisaged. Mein language is COBOL and a know ladge of some espects of Index Sequential Fi organisations and handling, GEORGE, II/JC Communications, ICL Softwere and FIND 2. TABN would be adventageous.

housing and other benefits; contect the Person Officer or Computer Manager. For an application of the Personnel Officer, Manor House Turners Hill, Cheshunt, Waltham Cross, Harts El 8LE, to be returned before 13th July 1978.

SENIOR SYSTEMS

(Pey eward imminent)

For further details of the dost, assistance wi

Software

Sales

To sell TPS - the leeding software product for ICL

communications systems. We are currently

taking one order every three working days end need additionel Sales Steff to respond to the tremendous demend for TPS end other Telecom-

puting quelity softwere products. Computer experience and seles molivation ere essential:

experience of terminel systems and ot coftware

ideelly we would like to meet system designers end programmars who have either moved or wish

merketing ore useful but not mandetory,

to move into seles.

TEHRAN

DON'T BE SHORT-CHANGED CHECK YOUR PACKAGE AND YOUR CAREER

HIGH TAX FREE SALARIES PLUS FAMILY **ACCOMMODATION AND OTHER** SUBSTANTIAL BENEFITS

If you have Honeywell 6000 or Levei 66 experience and are considering a term in Iran, then here are the best opportunities available. My client is one of the USA's leading Honeywell systems software companies and as such is able to offer the top packages for Tehran.

Consider the following:

TAX FREE SALARY

— A generous tax frea cash Income of between \$27,920 p.a. and \$33,680 p.a. for personnel with 4-8 years' applications experience. Higher salaries are svellable for more senior and specialized positions.

ACCOMMODATION

- The company provides a separate apartment for EACH employee, the size of which varies according to the family.
- The company paya for all utilities, e.g. gas, electricity, etc. with the exception of the telephone.
- The company provides a good standard of furnishings for the apartment including talevision, washing machine, fridge/freezer, etc.

N.B. The company budgets for an average of \$17,000 to cover first year rental and furnishings for EACH apartment.

ADDITIONAL BENEFITS

- -The company provides home to office transportation -The company pays local school fees for children over 5
- The company pays Medical Insurance The company pays emergency home leave where necessary

HOME LEAVE

- The contract is for i8 months' duration and a family trip home is paid for after

JOB CONTENT

The company has been awarded a substantial contract dua to its reputation for systems and software devalopment based on Honeywell computers. The scope of this project ensures a high level of job autisfaction.

FUTURE CAREER PROSPECTS

The company is a well established systems software house and NOT just a bodyshop. Consequently, they view each new appointment as the start of a long term career through an initial assignment in Tehran. In addition to IRAN, future opportunities exist in the USA, UK and EUROPE.

REQUIREMENTS

PROGRAMMER/ANALYSTS

- Minimum of 4 years' good expariance in COBOL with applications knowledge of GCOS and JCL.

SYSTEMS PROGRAMMERS

— Around 8 years' experience in DP with extensive knowledge of GCOS, GMAP, TDS and/or NPS.

DATABASE SPECIALIST

Around 8 years, experience in DP with extensive knowledge of GCOS, IDS. TDS and database design. **REF RW 24/1**

CALL DAVID J. HUTCHINSON ON 01-499 4501 TO DISCUSS

THE BEST OFFER AVAILABLE

CREATIVE **OPPORTUNITIES**

LONDON

My client currently operates a large twln IBM based bureau, specialising ln systems for the advertising industry. They are soon to take delivery of an additional machine, a PDP 11/70 to cater for their expansion programme (future plans include ordering 2 more PDP 11/70's during the next 18 months). Enjoying the financial support of their parent public company, this thrusting young subsidisry employs approximately 60 DP staff. It has good internol communications, with highly visible senior management and practices a "promotion totally on merit" policy. All the current systems are to be redesigned and rewritten to operate in an on-line environment offering a totally intograted package to cope with the needs of the advertising industry. Over 40 advertising agencies are serviced by these administrative and accounting systems.

DEC PROGRAMMERS £4000 - £6000 Basic+

JUNIOR & SENIOR

The inatallstion of a large disc based PDP 11/70 and the probability of 2 sddltional 11/70s in the next 18 months give rise to a heavy development schedule. Very interesting projects are to be undertaken including sophisticated on-line systems for the booking of TV time. The machine will operate under RSTS and use RMS II/K file management system.

JUNIOR Programmers will have the opportunity to develop their skills at a fast pace within a technically advanced environment.

SENIOR Programmers will enjoy significant responsibility in the development of sophisticated systems. Ali Programmers will gain highly marketable experience within a very attructive company. Both positions require some exposuro to DEC, programming.

SPECIALIST MANAGER

This person will be reaponable for the generation and maintenance of machine software and the development of PDP applications programs by his team. He will be highly experienced in DEC systems and possess a thorough detail ievel knowledge of RSTS. This is a superb opportunity for a strong technician to davelop his career into management through an interesting and challenging role.

RW 26/3

PROGRAMMER/ANALYSTS IBM DOS COBOL

To £6000 pa

In addition two Programmer Analysts are required to design and implement significant enhancements to current systems. This interesting project requires self-reliant young professionals who can enjoy a company atmosphere which encourages them to use their initiative and imagination to the full. The steady pressure of an assured workload will enable you to develop your skills at your own pace. Planned growth will allow the company to accommodate faat developers.

Call DAVID I. HUTCHINSON on 01-186 4561

hutchinson-scoggins recruitment

Grow with Telecomputing - nought to a £million in four years Over 130 users of TPS - the leading software for ICL online systems Over 60 staff working exclusively on the implementation of online systems on the ICL range

Software Design and Support

1900 2900 VME/B VME/K

Telecomputing continues to develop TPS as tha outstanding tp monitor for the ICL range. We ere now planning our new activere for VME/B, VME/K, and for intelligent terminals. We got it right with TPS - now is the time to join the small tesm who will develop and support another

Project

Managers

and

Consultants

Must have extensive experience in the design

and development of online tronsection process-

Telecomputing specialises in implementing

ndvanced systems using communications termi-

nels. We oporoto internetionally with overy client

oringing his own unique system requirements

and we need the senior staff to design and

ing systems.

dayslop those systems.

Applications Design and Programming Our client services teams continue to expend to meet the growing demend tor our sottware pro-

duct end project sarvicas. We naed more experienced programmers and systeme analysts/ designers. Junior vscsncies require st lesst ona-yeer ICL Cobol experience; in more senior positions your specific computer background is less importent. All our work is tor online systems but you can learn that after you join us.

Our teams have elready implemented applications such es order entry eystems, production engineering, stock controle end mail order. More sre in the pipeline. There ere opportunities et sil levels. Continuous training will develop your skille end promots your career growth.

our clients. Wa require an astablished lecturer in computer disciplines or experienced computer programmer with lecturing skills and etrong

Online Systems & Software

Oxford, London, Manchester, Amsterdam

training motivation.
You will not spend all your time lecturing. You will have the opportunity to keep stress; of the latest developmenta by spending part of your time working with the applications, design and progremming staff.

Lecturer (Commercial D.P.)

Technical To join a smell tesm providing terms! training to Writer

> Responsible for writing, publishing end updeting our systems end softwars publications for TPS online systems; i.e. manuals end bulletine covering systems design, programming, system creation and operating. We require an experienced computer technical writer or an exparienced analyst/programmer with the writing ekills end motivation to produce quelity publications for



Telecomputing started in Oxford in 1974 and hea mora than doubled in size each year. We ere now providing advisory, training and implementation sarvicee for inatalling online computer ayetems round the world.

Na have our own 2904 end a 2950 on order. Our ectivitiee are continuing to expend end we chell soon ennounce e microcomputer display terminel. This year we shall double in size egoin.

What you join Telecomputing you are taking the opportunity to develop your own career in a growth compeny. We hevo en informal atmosphere and axpect to pey attractive salsries and

Pleese write of phone; Petar Knowléa TELECOMPUTING West Way, Oxford OX2 0ED Phone Oxford (0865) 723621 (day)



Software Design & Development

Move your career into the 1980's. But do it in 1978.

Our clients are among the world's major investors in research and development.

With headquarters in the USA, they are currently designing and developing the communication systems of the future, using sophisticated software end the most modern hardware available, including main frames, minis

TWO ESSENTIAL QUALIFICATIONS

We are seeking candidates with a good first degree or postgraduate quelification in Computer Science or Electrical Engineering/Methematics/ Physics with Computer Science as an ingredient. Your experience may have been gained in eny sovironment involving the specification, design and testing of software for real-time systems, and whilst experience related to advanced

In the USA

telecommunications technology would be an advantage, it is not essential. There are also positions evailable for candidates with an interest in Advanced Systems Research and Planning.

THE REWARDS

As a successful candidats you will move ahead in terms of incoms, life-style, career progression and experience. Above all, you will enjoy the setisfaction of working in a company which recognises the vital importance of systems innovation to future business success: an attitude which is amply reflected in the back-up and rewards the company can offsr.

RANGE OF OPPORTUNITIES

Our clients' offices are situated on the outskirts of a major city with easy access to countryside and lakes. Relocation costs and immigration formalities will be looked after by the company.

We would like to discuss with you the range of opportunities available - opportunities which will enhance your experience, develop your career prospects and increase your earning

As an initial step, send brief career details or write or telephone for full details and an application form to: Euroselection, 6-8 Emerald Street, London WCIN 3QA or for an informal discussion telephone 8arry Eagles on 8righton (0273) 601699. Your enquiry will be treated in the strictest

euroselection Management Consultants

Netherlands

SPL's subsidiory in the Netherlands continues to grow fast and now needs more Computer Professionals.

We need

* A minimum of 2 years programming experience

* a good working knowledge of any major international mini-computer such as DEC PDP11 or Data General Nova.

* Practical experience of systems software wark on ony small computing equipment particularly in the areas of I/O handling, disc monitars, assemblers ar high level language campilers

* Experience of industrial systems applications based on mini ar micro computers

The total salory package will be very attractive to people at present working in the U.K. and will be in the range of £10,000 to £12,000 upwords. Applications from Dutch Nationals and others working outside the U.K. will be welcome."

If your experience does not fit these requirements but you are interested in opportunities or warking overseas with a major British software house please contact us anyway.

Please write or phone! Alan Taylor, Resources Manager

SPL International 12-14 Windmill Street, London WIP 1HF

01-636 7833 or phone direct Ulrecht 315534 The second second property of the second second

COMPUTER SERVICES.

CO COMPUTER SERVICES.. CWS Camputer Group

Manager National Computer Services

Manchester Based c. £9,500

CWS Computer Services satisfies the total date processing needs of the £1,400 million turnover Co-operative Wholesele Society Limited and in Co-operative venouses e computer earvices to Co-operative Retall Sociaties and other commercial organisations through its aix regional Computer Sarvice Centres.

Dua to expansion and reorganisation a Manager is required to take charge of the sk regional cantres and to further expend and develop the business.

An extensive knowledge offsorth the technical and commercial sepects of the computer services industry with a bise towards sales and marketing are essential organizations. with a plas towards sales and marketing are essential pre-raquialtes for applicants. Over end above this however, the man or woman appointed will be required to demonstrate a successful record of management echlevement against a background of rapid growth and technological change.

The Group operates ICL maintremes throughout its network comprising both 1900 and 2904 systems. A triple 2960 configuration is scheduled for delivery during 1979 at the Group Head Office in Manchester,

An ettractive salary in the ragion of the ligure quoted will be offered plus the usual fringe benefit aspected of a leading National Organisation.

Conteot: P.J. Cropper, General Manager, CWS Compuls: Services, New Caritury House, Manchester, M60 4ES, Tel: 061-834 1212 axt. 6820. (office hours) 062-583 789 (svenings).



CWS Computer Services 162 Walton Road Liverpoot L4 48A Tal: 051-207 0457

CWS Computer Services 22 Abbey Street Warwickehire CV11 5BT Tel: 0682 384107

CWS Computer Sarvices Barley Mow Chester-le-Straet Co. Durham Tel: 0832 406321.

CWS Computer Services Crebbs Straet Suffolk tP4 5HT Tel: 0473 78616

CWS Computer Services 100 Morrison Street Glasgow G5 8LP Tel: 041-429 2100

CWS Computer Services Stratford House, Station Road Godsiming. Surrey GU7 1HH Tel: 048.68-28212/3



No profession is changing as fast as computing. That means exciting career opportunities. But it can also mean problems - for those whose careers fail to develop as fast as the technology.

Data Logic operates at the forefront of computing, applying the very latest hardware and techniques to practical commercial problems. We cover the range from mainframes to the smallest computers. We are leaders in the use of microprocessors for applications that not so long ago required lar larger machines. Several of our projects involve diepersed networks of ten or more minicomputers

The exceptional scope of work is important to our staff. We can match their individual experience to their projects. Equally, we can ensure that each project adds to their experience. As computing itself develops, so do they.

Over the past year Data Logic has grown from 120 professionals to today's total of 280. Our expansion has meant unrivalled opportunities for career progression. We are not prepared to promote people before they are ready for it. But when they are ready - and we give all the assistance we can — they know that the poeitions as senior programmer, senior analyst, project manager and consultant will be there waiting for them.

In short, people at Data Logic have some of the most satisfying work you can find. And the extra satisfaction of learning as they do it.

Project Managers

For meintrame, minicomputer end mixed processor systems, usually supporting isrminal networks. increesingly, Data Logic's turnksy projects involve multipls, eepsrated

minicomputers.
Applicants must have at least 5 years implementation experiencs. They must have menaged a sizeable project or have taken substantial team responsibility.

Database Consultants

To advisa cliante on the creation or upgreds of databasseend to sssist Dats Logic teams in the design of retrisvat systems. Projects will involve both maintreme and stendatone minicomputer configurations.
Applicants should have

experience in the deeign of record structures and have used at least one of the teading databass psckages such as ADABAS, tMS, TOTAL and DMS/2. Knowledge of banking or insurance is of particular interest.

Senior 2900 Minicomputer System Designer System Designer

For consultency and For work et the torsfront of the implementation projects, with a bisa towards large ICL 2000 models. commercial application of small computers. The mejority of projecte will involve date communications Applications will include database systems and communications and several systems now in their networks. Extensive knowledge is early sisges includs many rsquired of hardware cspability, opereting eystems and standard soltware. The scope for application of this knowledge and for caresr progression will be conelderable.

Interconnected processors. Applicants should have at iseat 3 years design experience, preferably including system sizing end

Scientific/ Mathematical **Programmers**

Principally for rest time minicomputer eystems applied to sasiyals and/or control in eclentitic snvironments. There mey also be eoms problem aciving in high level language on maintrames.

Applicants chould have a retavent degree in the mathematical sciences and one or more years practicel experience in assembler of FORTRAN.

PL/1 Analysts For meintrams projecta involving

COBOL and

a veriety of interesting end demanding applications, including banking, insurance, manufacturing and distribution.

Applicants should have 3-5 years analysis and programming experisnce...A sound knowtedge of CICO will be en edded advantage.

Digital Engineer/ **Programmers** For dasign and dayslooms ni of

devices such sa interfaces and terminele, with en smphasis on the uss of microprocessore.

Applicante ahould have a dagree n electronics or computer ecience and have programmed mini or micro. microcods tavel.

Programmers -Smali Commercial Systems

For implementation of transaction systems on a variety of minicomputers, idaelly, candidates should have experience of RPG1. BABIC, COBOL or FORTRAN applied in a commercial

Mdsi vacanciee sxist in our offices in Greenford, Central London, Birmingham and Manchester. Teisphons or write, indicating the positions of interest:

For Greenford and Central London, to: W. D. Barrow Data Logic Limited FREEPOST, Westway House 320 Rufelip Road East

Tel: 01-578 9111

For the Midlends, to. A.W. Tsylor Data Logic Limitsd FREEPOST Bitmingham B2 4BR Tsi: 021-632 6536

For the North, to: J. Anderson Data Logic Limited Warwickpets House Warwick Road Stretford Manchester Tel: 061-872 3232

For mainirama assignments we are saeking knowledge of IBM 370, ICL 2900 and 1900 saries, Burroughs B6700 and B3800, and Honaywell H6000.

For minicomputer projects, knowledge of Data General or DEC mechines is preferred, although a background with any other leading make of small computer is of

Data Logic offers four weeks annual leave, free insurance and a contributory pension achieve. Cars are provided for senior aisif. Salaries are excellent and all staff share in company profits. Per capita wa are probably the most profitable software company in the country.

WIXKIAD **APPOINTMENTS** LIMITED

Computer Personnel Consultants

SYSTEMS ANALYST

LONDON

To £7500

A systems enalyst with sound experience in commercial systems design and a desire to progress towards project leadership is required to augment an active date processing team. Candidetes will be used to functioning in a project team environment and working to good etenderde. They should feal confident enough to take control of a smell team and a total system, a programming background is not assential but would be an adventage. The ability to establish good working relationships with users and to communicate simply and clearly are more important factors of the job description.

The successful epplicant will work on unusuel and interesting epplications utilising some of the most edvanced techniques. A full training progremme operatee and is available to all

In addition to a competitive selery the company are able to offer a comprehensive package of

Ref. E1/2906

PROGRAMMING PROFESSIONALS **WEST LONDON** £5000-£7000 **IBM 370**

As a leading concern in their field our clients' commitment to date processing hee been well-established over e number of yeere. They are now seeking to extend their use of existing herdwere by developing a number of new eystems using sophisticeted techniques. They therefore require edditional steff to join a tachnically edvenced programming department, and

pley en ectivo role in the compeny's future growth.

Trenesction Processing and Detabese Management are just two of the fields in which successful applicants will be involved. Ideally they will have some relevent experience in these erees elreedy end be seeking to enhance their lechnical knowledge whilst making a move which can provide long-term opportunities.

Applicants who can offer from two yeers' experience upwerds, programming in an IBM 370

nstelletion, using COBOL or PL/1 will be rewerded with an excellent commencing salery end a valueble renge of fringe benefits.

PROGRAMMERS

To £5250

Our Client, a busy engineering company, is currently developing several on-line real-time

SLOUGH

* To receive Iraining in edvenced IBM softwore

Develop COBOL progrems involving database and TP systems Work on a variety of epplications projects

Fivo weeks' holidey e year

Excellent sterting selery end conditions of entploymont
 To join en ective sports end social club

-end you have a minimum of 12 months' COBOL programming exporience. Ilton this could be a good opportunity to eccelerate your cereer.

Raf. W1/2906

PROGRESSIVE ANALYST/PROGRAMMERS HERTS./MIDDX. BORDER £4750-£6250

Our client, pert of a lerge menufecturing organisation, is eaching progressiva D.P. professionals to metch their own exciting expension plans.

With the impending instellation of the company's upgraded mainframe, the extre capacity is

scheduled to ceter for new systems development.

The opportunity therefore exists for cereer minded programmer/enelysts to gein extensive enelytical experience in a veriety of commercial applications. The persons appointed will be involved in system investigation and will be expected to develop projects into a real-time

Reelising the importence of securing suitable candidates to join a professional team, the compeny offers competitive seleries, progressive cereer structures, four wacks' bloliday, sports end sociel fecilities end meny other ettrective steff benefits.

24-hour answering service Please telephone for a confidential discussion or write to: 30 Fleet Street London FC4Y IAA 01-353 0981.

SENIOR COMPUTER **OPERATOR** With Large **Systems Experience**

We are a Southempton based company which operates a worldwide through container shipping service on behell of live major shipping lines.

Recently we have installed a 86700 computer wish an on-line Database system to supplement our existing Honeywell 2060.

We now require a Senior Operator to work with both of these instelletions.

Il the challenge of such a position appeals, and you have obtained a couple of years large systems experience, preferably with Gurroughs equipment, we should like to

The post offers on attractive salary plus excellent tringe benefits. In addition relocation expenses will be given where

Please write or telephone for an application form to:



Mrs. L. Lisney Assistant Personnel Officer Richmond House Terminus Terrace

Pel: Southampten (0703) 34433 ·ext 3305

EXCELLENT OPPOSTURITIES in Challed Landon of shroad for CO N & U. X.A. N T / P & O.J. C T LEADERS, storting of late Resident

AMBRE, experienced last System / System / 37, System / 34 bankare, 2 sxp, 5 years minimus, £7,000 migrania J228 4

Univarsity of Bradford LECTURER IN COMPUTER SCIENCE

Schools of Studies in Computing after MSc. PG Diploms and Hon B. Toch courses in Computer Science and a riser S Tech. Comptoning and Date Processing courses commences October 1076. Lecturars are also impoved in reaching core pyrings to studen in teching core pyrings to studen in thoughout the University Science, within range £3660 to £7368 p.e.

PROPERTY OF THE PROPERTY OF T E7,000 bitempos J2286]
PRO GRĀMINEMS. 2-3 years dzp.
mein language RPERI on item. £6,000-25,000 bitelenes J2286).
18 M A8 SEMBLAS PRO GRĀM.
MERS., bilolunini 31 years dup.
SE,000-E7,000 bitelenes J2287. Further particulars and application lights (to be returned by 14 July charles for the Register, Review, Review APPLY: CALL'I MARILYA RKES, BUILDING SERVICES AFF ARENCY, HEMLEY \$213

JBA

Software Specialists

Illinois USA

\$18,000 to \$28,000 plus relocation.

A large international telecommunications group, who are world leaders in their field, have opportunities for software specialists to work on the design and development of sophisticated communications systems.

Applicants must have at least two years programming experience in high-level languages, preferably PL/l, and have worked on the design, programming and testing of real-time applications. A background in the telecommunications industry would be a definite advantage.

This is a positive chance to work on new technology where the career prospects are excellent Relocation" costs to the USA will be covered by the company. Interviews with the client are being held in London in early July.

If you are at all interested in these vacancies please telephone now to arrange an informal

> Contact: Jim Baker JAMES BAKER ASSOCIATES International Personnel Consultants 16 Maddox Street, London W1. Tel: 01-491 4478.

The Boosey and Hawkes Group

TRAINEE **PROGRAMMER**

Boosey and Hawkes the largest manufacturors of musical instruments in the U.K. on: seeking a Traince Programmer.

Applicants aged 18-26, should be educated to a good 'tt' level stignlard and tileally possess at least one year's operations experience on a large 2003/4 or System 3. This is on excellent appartunity for o person who is willing to work muchin normal hours and has a desire to make a career in Dota Processing.

We offer a competitive salary dependent upon ex-perience and oblity. Benefits include pension scheme and subsidised centeen.

For further details write to, or telephone: Eve Wood, Personnel Deportment, Boosey & Hewkes Musical Instruments Ltd., Deensbrook Road, Edgware, Middx. Tel. 01-932 7711.



DUSSELDORF

GERMANY

IBM/OS teskmaster programmer for 6 months' contract in Dusseldorf, excellent negotiable salary.

Focus Computer Consultants 01-487 5781

CITY OF BIRMINGHAM POLYTECHNIC The following vecancy exists in the Computer Centre which operates on ICL 1802S (32K), and its proposing to install other

SENIOR PROGRAMMER 63388,63702 + supplements of £312 + 5% (max. £208.58)

A working knowledge of all least two lenguages and asperlance of Educational Computing would be an advantage: Candidates, male of laries, may oblain application forms (reformable by 7th July 76) and further details from The Personnel O ficer, City of Birmingham Polysechnic, F. Block, Perry Barr, Birmingham B42, 25U Please quote rail AS/P/198. Canvassing will disquality.

Abraxas Recruitment Division

SHIFT LEADER

TO \$2,000

A pendant which wall orded in group dopted a segmentability. Suitable applicants will have an excellent ICL bright configuration of second reputation of second reputation of second reputation of second reputation.

SENIOR OPERATOR

An ideal appeat unity for an expressor an uperofin to progress or a highly professional ap morelles plus asperionau on ATM 370 using OS/VS I will be rewarded by an excellent at Fixe I He Averrence, subsidiased made, and aer ollowance

OPERATOR

CITY
19M 370 DOS/GRASP/VS Three shill system Susable applicants will have a minimum of 48 months' experience orni will be gloud communicators. They will array the first-class benefits associated with working for a company that sets legit stendards including. Managege subsidy, LVs, BUPA and Sparis lacilities.

SENIOR OPERATORS

DATA CONTROL SUPERVISORS

KENT/10NOON

TO £8,000
Applications are invited for two positions both requiring ICL 2900 / ISOO experience. Either OCORGE II or III
proferred. A strang commorcial background, possibly in a Surresu, and the ability to lieise effectively with

SENIOR OPERATORS

24,000 +
Two positions with a lorge linencial organization are currently open to applicants with two years ISM COS./VS
oxperionce. Knowledge of JCL and utilities useful. Company benefits include free restaurant and preferential
Managego/Loan Retes

OPERATORS

ICL 1900/2000 Three shift system Three operators are currently sequind by our clash, based near Northempton will say access from MI One year's experience on any ICL machine. Benefits include None year's highly Representations.

JUNIOR OPERATORS

We writern applications been enthusiastic TRAINEES with a good standard of education and willingness to learn feel lise to drup in any time during office hours to discuss a careet in computing

CONTACT: JABMINE CAINES FOR THISSE AND MANY MORE VACANCII

Abraxas Computer Employment Ltd

SURREY

To £6,500 SYSTEMS ANALYST To £5,000 i year's sacivels & delebase BYBTEMS ANAL/PROG Or RPB 11 prog to Issen analysis c. £0.500 SYSTEMS ANALYST c. £5,500 2 ysara' ilaaacial ayalema £0.500 SYSTEMS PROGRAMMER 18 miles ISM Assombier To £5,000 2 + years' Cobol Ts £6.000 Plan & Cobol 000,03 ot Fortras/PI 1 To £0,000 S years' licencial systems 18 meaths' Cebol Honeywall 68 Bystems analyst To **£5,00**0 PROGRAMMER PROGRAMMER To £5.000 2 years' low lovel Isnsespe c. £5,000 SYRTEMS ANALYST c. E6,000 2 ysara' experience RPG | 1 will train is Cobal c. £0,000 ROSRAMMERO Rogrammer 8 c. £0,000 i ysar'a caperiacce o. £4,800 18 mooths' commercial ideally PL/1 To £4.750

f year's execrisors er larther disialle and se application term planes phono er call lo.

AMES PERSONNEL

OPERATIONS STAFF CONTRACT OR PERMANENT

Computer operators and data preparation operators required on ISM, UNIVAC, HONEYWELL AND ICL equipment.

Selery renge par week:

EUROPE MIODLE EAST £160 - £180 £450 - £500

Telephone now for more information.

KEY OPERATIONS ASSISTANCE LIMITED



COMPUTER WEEKLY, June 29, 1978

XOREN

aitton House (East Wing) 54/58 Uxbridge Road Ealing, London, W5 2TL Tal: 01-567 1725

REAL TIME MINI SOFTWARE **SPECIALISTS**

£5,000-£9,000

Xoren is a young, independent software house specialising in systems design and programming of real time minicum-

Established in 1974, the Company has exponence of Operating Systems Com-pilers, Linkars, Gevice Drivers, Gebug Packages BASIC SOFTWARE

COMMUNICATIONS

PROCESS CONTROL

Terminal Emulators Pipeline Control Alain Monitoring, Outstation Simulation, Majorials Test

Message

Message Switching. Telaphone Systems Onla Collection, Concentrators

The Company possesses two in-house PDP til computers which it uses for program devalopment and has appertise or most of the major makes of minicomputers and a number of processors. Currently the Company is working on projects for clients in North America and the UK.

Applicants ehould be able to demonstrate a good under stending of realtime systems and have a gound knowledge of at least one minicomputer or microprocessor.

A member of the Pioasa write to or telephona Mr J. Jarvia giving details of experience

Knight is right for contract staff



Use Your Professional Programming Expertise With NCC £3,500 - £5,700 Manchester

We ere looking for severel dynamic men and women to use their professional programming expertise within a smell teem currently providing support end edvice to the Centre's customers for FILETAB on a verlety of herdware.

Should you have a knowledge of FILETAB already, so much the better - but whet we are reelly looking for is measurable experience in ONE or MORE of the following ereas:-

Low Level Languages-Assembler, Plan Operating System Experience George 2, George 3, DOS, OS

Reporting Utilities -FILE TAB, FIND, RPG

You will elso need the ability to get on with people of all types end have high-level communications skills. There is customer contact by visit end telephone with potential and existing

There are genuine cereer prospects into such ereas as development, education and treining or regional consultancy. Sterting salary will be within the renge £3500 £5700 and will be linked in Itlelly to experience. Conditions of service are excellent end Include 22 days ennuel leeve plus ten stetutory days, e contributory pension end fife assurance scheme end assistance with relocation expenses in appropriete cases.

The National Computing Centre is en organization financed by industry, commerce and government and plays e vitel role in the development of wider end more effective computer usege throughout the country. Our Menchester Heedquerters is a modern city centre complex well-situated for local end netional trensport.

If you have the enthusiesm and expertise to take full edventage of these interesting opportunities then ring 061-228-6333 for an eppointment or application form, or write with full details to the Personnel Meneger, The Netional Computing Centre Limited, Oxford Road, Menchester M1 7ED.

The National Computing Centre



) Communicate with Racal

VOICE RESPONSE SYSTEMS

Chief Engineer Hardware

Head of Systems Software

Systems Engineers

Sales Executives

RACAL MILCO, a member of the world lamous Racal Electronics Group, is a leader in data transmission techniques, and is now to broaden its activities by creating a NEW DIVISION to market COMPUTER CONTROLLED VOICE RESPONSE SYSTEMS, for data entry and life enquiry applications

The following positions are our initial requirement and the successful applicants will assist in forming the basis of this new and exciting activity.

Chief Engineer, Hardware

The person we seek will have a broad background which may include systems or design experience in minicomputing in communications, data entry retneval systems or infelligent terminals Experience with PDP 11 would be an advanlege.

He she will interface with the Californie-based equipment supplier, and provide the necessary technical expertise on systems and product hardware to the Company and its network of foreign distributors, involving some foreign travel for short periods.

Travel for short periods.
Together with the head of systems software, the selected candidate will direct end support a feam of systems engineers. To provide a complete user system tacility. Probably aged 30 years and upwards, with a good degree, a strong practical ability, a self starting approach and the ability to communicate are essentiel qualities.

Head of Systems, Software

The position requires reasonably broad experience, which may include applications programming for batch and real time applications, data entry file enquiry systems, or min-computing in communications. Experience with PDP 11 would be an advantage.

He she will interface with the California based equipment supplier, and provide the necessary expertise on the software aspects of systems and terminals.

The solution contains will also have overall responsibility with the Chall Engineer (Clarity, and has the challance and support of a logituded Systems of represent and interface with arab contract software house frovidunt duction rates network of foreign distributions, my dying some burson havel for short periods:

Probably aged 30 years and opwards, will moved precisal ability, the right person will be methodical, self-stating and able to communicate

Sales Executives

To sell these systems, two experiences is the coverable and proven ability are sought for the South and North of

Familiar with the DP environment, a tyrekquorist of consultancy, bureaux, or turdware software soles; r. required, logethor with the ability to gras-passes. applications quickly

An altractive base salary will be offered, supplemonted by a commission, based on sensible sales largets The Northern position is based in Mainchester

Systems Engineers

Systems Engineers are sought to take responsibility for the implementation of customers systems and to support the sales learns. These minimand microbased systems will require a good working knowledge of both transvare and software. The position requires at least two years unor and peripheral experience prolecably with PDP 11: and communications environment. Equipment training will

Probably aged late 20 s. they will have a good peactic at ability, a maltine allidude and his able to comprise the with customers, software houses, and held service stall.

The NEW DIVISION will be satisfied in Becaling (Berks, and the attractive total regions adjust package will refer time significance of thesis key appointments

Please write giving details of experience, qualifications and present salary to The Personnel Officer, RACAL MILGO LIMITED, Prospect House, Thorn Street, Rending Borks

University of Essex

DEC system-10

Systems Programmer

in the Department of Computer Science Computing Service

Applications for the post of Systems Programmer in Grade Computer Officer 1A (setaly scale £3,650-£8,178) are invited. Applicants about have a sound background in the theory and practice of operating systems. The successful applicant will also be fluent in assembly language, interests in distributed processing systems, micro-processors and computer networks would be a distinct edvantage.

The successful applicant will join an established Programming Group, which has responsibility for all sepects of software meintenance and development on the University a service machine. This is a OECsystem-10770 providing an extensive Timesharing and Batch service.

Applications (six copies) including e curriculum vitae and she names and addresses of two referees, should reach the Registrar (AG/39/CW), Usive raity of Essay, Wivening Park, Colohester CQ4 38Q, from whom further particulars may be obtained by July 20, 1878.

A Section of

MANAGEMENT POTENTIAL ANALYSTS & PROGRAMMERS to 6.5k SURREY, SUSSEX, MIDOX., BERKS

retal of our client Companies have bevised in that siyals and Programmers with stanzagestant estimate.

The equipment range covers (CL J900 and 2000 beries, that 360/370, that Systems 3, Burroughs Reneywood and PDP11 whilet the languages include DBOG. PLAM, ASSEMBLEA, P.J. RPQ and PORTRAM Gar specialised experience and close contact with leading allpat corporate to be computer field value as to bird you expert percapel shote.

Simply phone us and net for the intermetten - What could he paster? Phone A.B. Executive [projection] 9822 41821 [Committee]

Burroughs **Software Programmer**

WOKING: £5,225

Due to internet promotion we have an opportunity for a Software Programmer to take responsibility for, and to develop, a wide range of in house software utilities.

Candidates with Burroughs experience should ideally have a sound knowledge of Cobol, a working knowledge of Assembler and have worked in a data communications environment.

Company benefits include liextime, tree lunches end modern working condition:



Applications are invited from suitably qualified persons to work on a project to colfect; and develop materials for a course in the use of the Computer in Education, to assist in the implementation of auxitable computer packages, and to infattle research into the use of the Computer of Secondary School level and with situation of work in achieve and with situation of work in achoeis, especially well-interactive systems; would be desirable. The appointment in for two years perferably from 1 October, 1978, or as soon as possible theirester.

Selection acels £3.860 to £8.178 plus

esperimentation from Assistant Sep-france: particular from Assistant Sep-istres (Education). University of Spranghem, PO Sox 303. Strangham 918. 277. 16 julying Application [10 toping Defences the Laptices. (10 pp.) should be sent by 14 July, 1973.

UNIVERSITY OF STRMINGHAM Metropolitan Boro WIRRAL POST OF RESEARCH FELLOW IN COMPUTER EDUCATION

PROGRAMMER £3861-£4214 (inclusive of supplements)

To join a team developing systems on a 19031 installation numbing under Geogle 2+. Opportunity for a kean person with the right experience to be involved in dayelopments concerned with financial and non-time territories of PLAN in addition to COBOL and advantage.

Application forms from the Director of Fiscase, PG Box 2, Trackey OS .447 7000 art 340) jettimetels by 16 July.

HONG KONG POLYTECHNIC. Department of Computing Science

Applications are invited as Principal Tactorial, Separa Lecturer and Lecturer fevels for the Department of Computing Science of the Hong Kong Polytechnic The Department offers courses leading to a Higherian Computing Studies, a Higher Diplams in Confusion Studies and a Higher Diplams in Systems Analysis A Mayobaship after once advanced work leading to an Associateship in Computing Studies is now under consideration.

Consideration

The Cepenment's own courses size of present commercially oriented and emphasis is placed on present work. Students are required to spend a minimum at 15 weeks for slocal OP department at an energial part at their course, in addition to undertaking projects and caus study work. From October this year the courses will be offered under a conditional system.

creations system.

The Polytechnic shares computer facilities with the 2 local Universities. Substantial batch projecting facilities are available at all 3 institutions addition, all present developments will facilities are available at all 3 institutions addition, all present too Institutions the sharing of resources. In Polytechnic's compassione, and it is planted that this lights will rise to approximately 300 by 1930/St.

Suppossmately 300 by 1930/St.

Successful applicants will have expense in one or more of his following stess. Advanced COBDL. Advanced Systems Analysis. Systems Programming, Real Time Systems, Project Management and Consol. Systems Advanced Management Information Systems and Computer Organisation.

Ganeral Qualification for Appointment

Principal Lectures: (a) a degree or professional quantizations, and (b) and distanced apacialist qualification or automore experience to a submitted that and the qualification or automore experience to a remot tield; and (e) substantial teaching and industrial / commercial and (d) proven administrative ability

Senter Lecturer: (a) a degree or professional qualifications, plus professional an advances pocenist qualification, and (b) at least five years to unital commercial experience and (c) authat antiet seaching and for proven additional vestal, and (d) proven additional vestal, and (d)

Lectures (a) is plagues or professional qualifications or at teast a Higher Technician qualification in the appropriate field of study, and (b) at least three years professional or industrial commencial aspectance or at least three years teaching steps increase or a suitable combination of professional mass are more as a suitable combination of professional mass are more as a suitable combination of professional mass are more as a suitable combination of professional mass are more as a suitable combination of professional mass are more as a suitable combination of professional mass are more as a suitable combination of professional mass are more as a suitable combination of professional mass and the more as a suitable combination of professional mass and the more as a suitable combination of professional mass and the more as a suitable combination of professional mass and the more as a suitable combination of professional mass and the more as a suitable combination of professional mass and the more as a suitable combination of professional mass and the more as a suitable combination of professional mass and the more as a suitable combination of professional mass and the more as a suitable combination of professional mass and the more as a suitable combination of professional mass and the more as a suitable combination of the more as a suita

Principal Lecture: HKs 91.740 cg. HKs 113.340 p.s. by 5 mr. remains Senior Lecture: HKs 91.740 cg. HKs 113.340 p.s. by 5 mr. remains Lecture: HKs 40.920 b HKs 70.980 p.s. by 11 increments Hote E1 = HKs 8.68 ch 15th June 1978.

Commencing salary will be commencing with qualify significant experiences

experience)

COMMITTO NEW DESCRIPTION OF SERVICE

Appointmentall be on the year granted bearing contract terms mitigly.
Appointmentall be on the year granted bearing contract terms mitigly,
authority subside appointment says be aftered further contracts on
Berifits include long serve test passages; subsidied accommendation
medical and depts tractment; chiefren a situation at the polytechnic
medical and depts tractment; chiefren a situation associated and
profession forms and further information are admirable from the
depter approach. Complete the profession are admirable from the
form Kenn Complete Approaches, Alleg Heart Kennises.

How Social Services approaches approaches being the profession of the
form Kennise.

LOOKING FOR SOMETHING DIFFERENT?

CHIALITY ACSURANCE ANALYSTS SALARY CEG, OOO P.A. & CEMERTYS OPERATIONS AMALYSTS SALARY 625,500 P.A. - GENERIYS

Our client, based in the WEST MIDLANDS, is the Computer Services Depertment serving a large Group of Companies. They have a current requirement for e number of "DATA PROCESSING PROFESSIONALS," who will be involved with varied and highly sophisticeted Commercial projects utilising letast generation hardware.

Vacancies exist for:

ONDANTY ASSURANCE AMALYSTS

Ideally you should have:

* a minimum of 4 yaers' programming experience with a fluency in COBOL/JCL

* an analysis background, which should heve included soma involvement with the design end implementation of

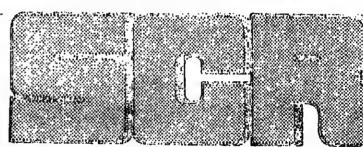
* a knowledge of DATA BASE, file handling and STRUC-TURED programming techniques

in addition to the specification of JCL for production and systams testing purposas All candidetes should have e sound aducational background with e minimum of 2 'A' levals, but preferably with en HND or ralevent computing quelification.

CAREER prospects within the organisation era EXCELLENT and above averege TERMS end CONDITIONS apply. RELOCATION ASSISTANCE IS AVAILABLE.

If thase eppointments interest you, than telephone ma — Rod BEESON on 021-236 3781 or 021-745 5441 (EVENINGS & WEEKENDS) REF. NO. CW/6/4

SPECIALIST COMPUTER RECRUITMENT LIMITED



OPERATIONS ANALYSTS

* heve a minimum of 3 yaars' computing experienca, 18

★ be rasponsibla for tha design and development of opera-

* ba involved in developing standards and documentation.

term plenning of the Operating DIVISION

operating anvironment

months to 2 yeers of which should have been gained in en

tions projects end will provide for the madium and long

PHENICALISM MARKETALISM Reepost, Equity and Law House, 35-37 Great Cherles Street Cherensway, Birmingham B3 28R

MIARICHESTES COLUS GART freepost.Blackhiars House, The Parsonage, Manchester M3 880

LONDON OR OSS CAUR Freepost 6, 102, Blandford Street,

Computing Scrvices Association

SYSTEMS ANALYST

A systems analyst with 1 year's nonlysis and at least 2 years' COBOL programming experience is required by our

chont in the heart of rural Kont. The installation is at prosont en ICL 1901 soon to be upgreded to cater for their continuing growth in the computer department. As well as the upgreding of current equipment the company have a 2950 on order, therefore this gives good opportunities to become involved in the development of new systems. The company offer good promotional prospects plus free private health insurance, pension end disebility schomes end modern working conditions, for more deteile inquire now.

SENIOR OPERATOR

Our client is looking for an operations person with a minimum of 1 year operating experience on IBM 370 equipment. There are severel positions open for senior operators in this installation, applicants are not required to have senior operator experience but must have a good knowledge of the DOS operating system, preferably with

POWER/VS or GRASP If you currently heve operators responsibilities and would like this opportunity to improve your status and career prospects then phone now for more details.

PRIME TIME FOR A MOVE

Why not extend your experience to the new world of Prime Computers. Under a new scheme we are responsible for assisting users of Prime Computers in the recruitment of capable COBOL programmers with 2 years' plus experience.

Successful applicants will receive first-class training on full salary for

Gryphon Computer Recruitment

Essex House Cherrydown Basildon Essex

an initial period after engagement,

For further details inquire now.

ANALYST

An interesting challonge for a pure analyst. Devalooments ere under way in this twin ICL 1900 installation on most o their current eystoms including on-line, stock control, purchase and production control. Applicants will need to heve hed 3 years programming and snelyet experience including business experience on commercial systems. The company offer good selenes and company benefits For more details phone now.

CUSTOMER SERVICES **OFFICER**

This position requires a person to liste between the Octa-Processing depertment and the computer users within the company, regarding procedures, problems and usage. The applicant ideally will come from an operations environ-ment with IBM herdware experience, and will have a current position with at least Senior Operator responsibilities. He /she will need to have a good knowledge of OP procedures and an ability to communicate with people at all levels.

This le e challenging position with good prospects and chance for the right person to play an important pert in the smooth running of the installation. Phone now for more



GRYPHON

Contact Chris or Olivia on 0268 282155

knowledge of electronics and digital systoms. This post provides en exciting opportunity for a person wishing to make a career with a publication which servee the world's most dynamic end fest-

growing industry.

There will be no time to get bored, but there will be time to learn e lot ebout e journel end en industry which ere booming like no others.

This position cerries e high besic selety, en ettrective bonus echeme end e compeny car. There is e contributory pension scheme and e subsidised staf) restaurent.

Apply in the first instence to Guy Peerce, Sales Mansger, Systems Internetional on 01-261 8356 to errange en informal meeting. Or write to him at Dorset House, Stemford Street, London 8E1 9LU.

GOVERNMENT OF KUWAIT

URGENTLY REQUIRES

IMS System Designers Analyst **Programmers**

SALARIES up to £18,000 Per Annum (tex free et present)

The Kuwait Government is currently implementing a large online system and requires additional staff to augment its development teem.

Applicants should possess severel years' experience of working in en IMS online environment. Programmere require a thorough knowledge of COSOL. Applicants possessing a degree is preferred.

Successful candidates will receive tree turnished accommoda-tion, 45 days' leave per ennum with free sir tickets for them and their femilies.

Applicants passessing the described quelifications may write. giving brief personal cereor details to

Celection Division Civil Service Commission P.O. Box 1G74 Safet Kuwalt

FROM THE UK . . . TO THE USA

Progremmars/Systems Anelyste / Systems Programmats/Soltware Development Specielists Programmats/Soltware Development Specialists with 2-10 years' exp. on large-scale and/or minicomputar systems (\$/380/370, H-8000, U-1100 etc., end/or 0EC/OG/H-P/etc. minicomputar systems (\$/380/370, H-8000, U-1100) etc., end/or 0EC/OG/H-P/etc. minicomputary Sept. start date with leading international computer-consulting and turnkey-systems firm. Must be willing to train and work USA-wide and at future UK/European locations. Dedicated results oriented professionals, who ate interested in top career-growth opportunities, please . send: summary of educ./exp./salery-progress, end homa and office contect-info end June 28th-July 1st interview eveilebility, to Jim Allen, Hervey Peoneck &

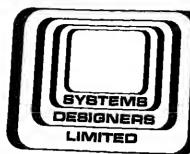
INTEX (Execs, UK) Chancery House, 53/64 Chancery Lane London WC2A 1QU. Phone: 01-831 6825

The Polytechnic of Central London & L. BSC (CNNA) IN COMPUTING (Paretime)

A 4-year course (3-year for guitably qualified students) for one day and another evening each week.
The course includes programming, principles of computing, herdwarp, software systems, data processing, data base design, systems analysis, business organisation, mathomatics, a(stratics and operational teserch).

HND COMPUTER STUDIES ENDORSEMENT (subject to approval)

A one-year full-time course following HND or HNC Computer Studies. The course includes programming end a project, with two options from systems erchitecture and operating systems, advanced programming theory, date processing and information systems. data processing management management form. The Registry, Engineering and Science PCL 115.
New Cavendish Street, Landon WIM 835: Telephone: 01-488 3811



Programmers & systems engineers in Manchester: up to £7,500

Systems Designers Limited is en independent British systems consultency, backed by the NEB, end with an unrivelled reputation in mini nd micro computer epplications. Established in 1968 end currently 150 strong, the compony is expanding its operations in both the UK end ebroad. A full order book end continued demends for our high quelity service heve produced an immediate requirement for a number of professional programmers and systems engineers for our Menchester office.

Curront projects ere chellenging and rewerding end the company policy of full participation of all members offers broad prospects end opportunities for repid progress for top people.

Requirements exist for people with broad experience in the design end implementation of mini and micro computer systems using both assembler and high level lengueges. We ere interested in heering from progremmers and systems angineers with at least lour yesrs' experience. Applicents must have good acedemic qualifications and a proven softwere ability, together with e prolessionel outlook.

Please write to, or telephone, Mike arey et our Head Office

ams House, 27-21 High Street, Frimley, Surrey GU12 5HJ Telaphone: Camberley (0278) 63471

Supervisor — **Computer Systems** and Programming

Bahrain c £18,000 pa tax free

- * Free eccommodetion and utilities
- * Peid home leeve
- * Free Company echooling end/or educational essistence ellowence for eligible children

The Cahrain Peiroleum Company Limited, e lerga oil producing, telining end marketing company, oilars a challanging opportunity for a Supervisor – Systems and Programming in ite tapidly daveloping Computer Services Opportunity besed in Awaii which is the Compeny owned Iownship on Sehtain. The town covers an erea of nearly a square mile and provides homas, community services and recreational lacilities for employees and their lamilias.

The Computer System comprises a System 370/135 with 512K, operating under OS/VS1 and a System 3/12, both with batch and online proceeding. The data base is TOTAL with ENVIRON for its teleprocessing support.

A wide veriety of technical and commercial applications are already in use. Additionally major areas of davelopment are proceeding making use of teal time, remote communication, end dete base management, lachniques.

The Incumbent will be required to lead a learn of Analysts and Programmers 6]. Applicants should have at isset 5 years systems management axperience in a medium-alzed or large computer centre. They must be able to demonstrate highly professional ekills in systems analysis and profess is able to and should have taken of least one major system from feesibility to implenien-

They must be familiar with 18 M 370 and be knowledgeable in various progremming ischniques with date bese experience preferably TOTAL and its tale processing support ENVIRON. This senior position requires a high managerial skill and ability to communicate at corporate level with a local and international management. Cendidates should have a degree or squivalent.

Tours of duty are lot one or two yeers (optional). Free medical ellantion for employees and line method or bachelor ecogminodation provided. In certain circumstances lacilities for interim leave are available for member parsonnel living in Awell on bachelor status.

Please send details of age, qualifications and experience. requesting on application form to:

Personnel Asietions Department. Celtex (U.K.) Limited 30 Old Burlingion Street, London W1X 2AR Oupling reference CP/C.



CAPITAL APPIS

FORTRAN

PROGRAMMERS

PROGRAMMERS

CO

PROGRAMMERS

CO

PROGRAMMERS

CO

PROGRAMMERS

CO

PROGRAMMERS JUNIOR FO £3100 to £4350 [] assess 01 995 3883 [] 637 5551 day, 635 9659 eve.

FREEPOST LONDON WASAR

TRAINEE SYSTEMS PROGRAMMER 10 £5,900

TERATUR

10 £4,000 +
poison with 3-1 years' repaired to it fulls/vs. vm inspected for this term

62/14tc antichlation, intensity of 2 state systems to the City of Landon
openning approximates

coll X-Caldiur on R1-353 R2Ot / 3 or with to 47 Essex Stirret, London WC2R 3JF

COMMUNICATIONS

ENGINEERS

JUNIOR and SENIOR £4,500-£7,000

to work in our Grent Portland Street headquarters

We are the wucht's targest independent

which control access to unconsinframe

proviuus knowledge al communicaliare

computing methods.

MULTIPLEXORS.

E.D.P. professionel.

. Software applications.

4. Inetallation Management.

You have worked on:

型 DEC PDP8'S IT'S MINIS

computing hureau supplying computer access to over 40,000 miles of international satellite linker

We have 200 minis throughout not network

Wu ore looking for ungineers who are able to work no thoir own indiative, prefinably with

SYNCHRONOUS/ASYNCHRONOUS MODEMS

and onjoy the prospect of excellent career volugiment, then ring:

PAUL BARFIELD on 01-637 1355, oxt 252,

write to: Peul Barfield, ADP Notwork Services Ltd., 179/193 Grent Portlend Street, London W1N 5TB.

U.K. SYSTEMS

MANAGER - 10K

A highly successful mini-computer Company

require en experiencod markeling orienteted,

The candidate must possess a thorough knowl-

1. Mini-Computar tachnology - hardwere end

. Pre- end Post-Seles Merketing techniques.

The selary and quertarly bonus will result in an income of 10K approx. and a Company car will be provided.

Please reply to : Box No. 1985, Computar

Weskly, Dorset House, Stamford Street

lo £5,000

£4,000

SENIOR OPERATOR

SYSTEM 3 OPERATOR

OPERATOR

Price yours applicately depositioned all you be not OSVS1 of MFT II inquired by City bank 18M :

MANAGEMENT & EXECUTIVE SELECTION

COMPUTER WEEKLY, June 29, 1978

telephone 01-637 9611

WHO IS OUR CLIENT?

* The West London branch of Europe's leeding independent software house and computer service bureau.

WHAT DO THEY DO?

- Design and program commercial systems on e wide renge of mini and mainframe computers.
- Conduct consultency essignments, including herdwere eveluetion and turnkey installation.

WHAT DO THEY OFFER?

- * Top salaries, up to £10,000 p.a., plus excellent fringe benefits.
- Unrivalled opportunities for promotion. * Good working environment end very sociable company.

WAITING?

can offer the following:

Anelysis end design of at least one system.

'Phone Derek Pearson today for further details

WHY ARE YOU

WHO DO THEY NEED?

Experienced ANALYST PROGRAMMERS who

* Two yeers programming, preferebly in high level language.

ment responsibility, end customer end seles involvement.

At e less senior level - the ebility to develop these skills.

Commerciel, Accounting or Finencial epplications experience.

* At a senior level — experience in project leadership, menage-

Suite 201/6 Albany House 324 Regent Street London W1R 5AA 01-637 9611

MANAGEMENT & EXECUTIVE SELECTION

ANALYSTS To £7500+ ANALYST/PROGS To £6580+

PROGRAMMERS

To £6500+

ricing an tiglialt of a number of clients throughout London and. Southern England, we am tooking for people experienced in one or more of the following

*COBOL (any m / c) * 10M Assombler * PL / 1 * CICS * IMS * Any Mini * PDPt t * RSX t tM * RTL2 * Mecro t t * RSTS/E * Onsic + * GEC 4000 * tCL 2900 * ICL 2903 / 4 * 8 anking * theorems. Financial, or Commercial Systems * Graphics * Minis (Commercial or Technical) * Manufecturing *

Excellent fringo benoliis ere elso offored by almost all our

Why nut call us now? You have overything to gain!

MAGROLOGIC MANAGEMENT SERVICES LTD. (Recruitment Consultancy Division)
Tel: 01-437 2243 (Osye) or Swenley 65985 (Eves/

Senior Analyst

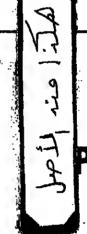
Programmer

Iran Air requires a Senior Analyst/Programmer with a minimum of tive years programming and design experience on ninincomputers, preterebly IBM SYS/32, on finencial empirications. Based at Piccadility the position, offers much scope for travel and in the conversion and development of an on-line accounting

Wo offer a good competitive selery with many lings benefits, working conditions are excellent and there are valuable travel privileges

Please write (do not telephone) with personal and clear details to the Personnel Department, tran Air, 73 Plocadity, London W1V OOX marking the anvelope "Senior Analyst."





ANALYST **PROGRAMMERS** TO £6.500

Trident computer earvices working on behelf of an international company located in West London requires additional D.P. professionals to work on a new integrated commercial project covering all business application eraes including purchasing, accounting, payroll, personnel, manhour control, sub-contract, cost control and material control. Using an IBM 370/145 with VM It is intended to introduce edvanced detebase and teleprocessing techniquee in the forseeable future.

Applicents for the job should have a minimum of 3 years' COBOL progres ning axperience, preferebly IBM, with at least one year's exposure to commerciel business systems.

Fringe benefits include peid overtime, bonus schema, subeidised funches, free life assurance end e genarous pension schame

Applicants in the first instence quoting Ref. TCS/187 to be made to

TRIDENT COMPUTER SERVICES LTD.

SENTRY HOUSE, 110 FRIMLEY ROAD CAMBERLEY, SURREY GU15 2QN

Tel: (0276) 84252 (24 hour service). Telex; 858386

Licensed annually by the O.D.E. as an Employment Agency and Employment Business

ANGLIAN =D.P. SERVICES LTD,

COMPUTER **PROFESSIONALS**

Fed up with commuting to London? We have e job for you in East Anglis.

Systems Analyst (IBM)

Analyst Programmer (NCR) Cembs. £4,500

Senior Programmer (iBM) Essex. £5,000

RPG2 Programmer Essex. £4,500

Operator (NCR) Essex. £3,500 +

Phone: Denbury 4256 (STD 024541) or write to: ANGLIAN D.P. SERVICES LTD. Stratford House, Meldon Road Danbury, Chelmalord CM3 40W

SYSTEMS MANAGER c. £700

To head up one of the two systems groups responsible to softwere support to the sales force throughout Europe. This is senior position requiring demonstrable skills in organising at motivating a team of highly competent Systems Engineers pre- and post-sales altuations. A solid background in busine systems design and soltware is essential, and experience in banking environment will be especially useful. FIELD ENGINEERS c. £500

SHEFFIELD and LEICESTER

To install and maintain the company a wide range of hardware Maintenance experience of miniprocessors, magnetic tape at disk units is assential. Full product training will be given

All positions are open to male or female applicants, a All posttons are open to mate or female applicants, at include company car, pension scheme and health instrance benefits. To apply, please write or phone (rever the charges) sither:

Isn Wads (European Support Manager) or Roy Wolland (Engineering Monager).

OCA SCANDATA LTD,

OCASCANDATA LTD,

Occasion Makes

Queen's House

Holly Road Twickenham, Middlesex

Heymarket Computing are D.P. recruitment specialists to 35 companies in the Herts/Middlesex eres. Such ie the current computer employment merket that st any one time elmost ell of these companies have vecancies for Analysis and/or ogrammers. At the present moment, however, our most urgent need is for nelysis on behelf of 12 clients in the following areas. —

Cockfostera Potters Bar Weithem Crose **Hemel Hempstead**

Southgete Tottenhem

Seleries renge from £4,600 to £7,500 covering ell levels of experience from Junior

For more information ring: HAYMARKET COMPUTING LTD. Tel: Cuffley (Herts.) 4130 up to 6.30 p.m.



ANALYST/ **PROGRAMMER** Salary c £6,000

Small, but expanding D.P. dept: require analyst to assist in developing new on-line systems for ICL 2903 and be capable of deputising for D.P. manager.

Friendly environment for self-motivated person. Knowledge of ICL software, COBOL and Enquiry Systems preferred.



R. M. A: HUNTINGDON, DPM WILSON BROS. GREETINGS CARDS LTD. **ACADEMY HOUSE** 45 UXBRIDGE ROAD HAYES. MIDDLESEX

DATA PROCESSING MANAGER

Our cliem, e E30M T.O. subsidiary of a major Public Group, with a newly as ablighed O P. O spanment based on IBM system 3 hardway and softway, seeks a Manager of the highest calibre.

sanja, sged 25-30. should have e round innoviedge of sophisticated accountancy based system. a and implementation of immagorment information, systems, and have a background as an analy of Fortran). An excellent stanting salary and estractive banetits packaged is offered. For further of

alian cameron associates Itd International Management Recruitment Consultents Walter House 418-422 Strand London WC2 01:836 5959

ON LINE

We are in the middle of developing a completely new total on-line system for our multi-million pound purchasing and supply operation.
You would be in on the ground floor, applying your own expertise and ou have Cobol and think you measure up to an

ANALYST/PROGRAMMER to £5.5K

job in the team dealing with this project, and with the possibility of further progression, telephone Jim Spree, West Mailing 845845 extension 2374 for further details and application form, or write to him care of County Supplies Department. The Air Station, West Mailing, Kent ME19 80G.

The County Computer Unit and the Department are located in pleasant rural surroundings near Maidstone, We'll assist you generously with removal expenses.



Electrical TECHNICAL Equipment-For Sale SUPPORT Ollors ere invited laz iho equipment detailed below which is instelled end in use at County Hell. ENGINEER Kingston-upan-Thames. Surrey, end which will shortly

becomo surplus to

requirements
Manufacturer: Mawdaley's

Motor Alternetor Set: 415 volte/415 volte 3 phase 59 HZ. Output: 45 KVA rpm continuously rated. Seriel No

SEY1519/SFA/1313/

Manufecturer: Controls (GW8) Ltd. App roalmate date of manufacture: 1955 Control cubicle for shove including isolator, aton/start apped/units

top/start, smps/volts

selector switch and meters and pilot indication of main

The squipment may be inepected by errangement with Mr. G. W. Price, Principel Electricel Engineer st County Hell (Tel. 01-546 1050, Ext.

eler than 17 August. 1978 lo

PLYMOUTH POLYTECHNIC

Camputer Centre

SYSTEMS

tCL 1000/2603 Systems

Balary: £4343-£4827 (Inclusiva)

Ta be responsible for the mainte-nance end davelopment at the Centra's 64K 1803A system and 28K 2003 system.

Esperance is assential, preferably with Goazge 2 and Maximap. Knowledge of Fartran and Bosic would be advantageous.

This is an apportunity to join a young, anthusiastic teem which provides a wide range of iscillities for the Polytechnic

Application lams to be returned by 14th July 1978 can be obtained with further perilculars from the Paracanast Officer, Plymouth Polytechols Onto

lymouth Polytechnia, Orake ircus, Plymouth PL4 BAA.

MEOICAL RESEARCH COUNCIL

MEDICAL SOCIOLOGY UNIT

COMPUTER

ROGRAMMER.

EXECUTIVE

OFFICER

An experienced programmer is required in join a team working on the development and implementation of a unique medical data base. The work will be carried out on the Aburdeen University Honeywell 05 / 05 computer. Selary eccording to qualifications and experience on the scale CZ 540 - CA 579 with a maximum earning point C3, 207, with a maximum earning point C3, 207.

gradient in the Salbur

POLYTECHNIO:

RESEARCH OFFICER

The successful applicant should be witably qualified in compluter science, mathematics of engineering, with an elected in computer programming

The appointment is initially for two

The palary scale for Research Officers & C3.192 + £136 z 2 - £3.468 per

<2 ≥

Surry County Cauncil Supplies Department Supplies Roed, Epsom KT19 9AJ

3956) end written ollers should be submitted by not

thy, over voltage, etc.

Ltd. Approximate dete of menufecture; 1965

created an immediate vecency within MEMOREX U.K. LTD. for e Technical Support Engineer to strongthen the OEM Division.

The ideal cendidate should be over 25 years of age with a background in minicomputer systems end poripherals. Knowledge of plug competible tope and disc subsystems would also be an

The position, which is primarily based in the U.K., will in some cases involve assignments abroad.

Salary will be eccording to experience and quelifications, plus generous lringe benefits that you might expect from a successful internetionel company. A compeny cer will be provided.

Telephone or write giving cereer experience to

D. Litten DEM Equipment Sales Meneger Memorex U.K. Limited Hoechat House, Sefiebury Road Hounslow West, Middlesex Telaphone: 01-570 7716



IBM SENIOR OP

CITY

Our clients, en international banking arganisation, require an Operator for their 16M 370, Installation. Only intelligent, self matilizate applicants with appear 2 years OS experience will be considered for this progressive company who demised a high level of lechnical appeties. In addition to en accellent selery, benefits include subsidised managage, ennust bonus, LVe, n/c parsion, SUPA, 1/1 foams, mileage ollowence etc orc.

IBM OPERATORS

G. LONGON 64490
We have Iwo requimments for Operators with
12 menths DOS VS a sperience to join leading
banking organisations, using mid-range ISM
370 headware. Both companies effor excellenprospects and hinge benefits, with 2 or 3 shill
working.

IBM OPERATORS

C. LONGON C4400
A minimum of 12 months GOS VS experience
required to join this major commercial

CITY A minimum of six months aspositoria is to quied to pin this major insancial concern. A 2-shit system is in operation and a subsidised mortgage is also everlable. **PROGRAMMER**

ICL OPERATORS

A major menulacturar in the above area to prepared to remain any Operator with Secret 3 apprents on their ICL New Range 2860 / 2970 and 2980 Computer.

UNIVAC DAYS ONLY

This large undepundent manufactures smalled m the green belt ered of London, required shift leader with 2 years' experience of Univace 907/30 to supervise and use the disty Com-nutor Operations and Communications equip-ment remaining under OS3.

ICL OPERATOR

OPERATIONS - VARIOUS

13 mile 13 mile 12 mile 12 mile 9 mile+ tz oths 18 oths 12 oths ICL 1900/2000 OPERATORS

12 MONTHS: EXPENSENCE 3 MONTHS: EXPENSENCE 3 MONTHS: EXPENSENCE E4000 E3000 I 2660

TRAINEES £2250-£3250 We always have requirements for genit "O" level, "A" level and Graduate Transger lar pesitions in Lendon and the Home Chunture.

COMPUTER TWO THOUSAND 01-837 3265 217/218 Tottenitam CI Ad. WIP 9AF

Centre Européen pour la Recherche des Cadres

systems programmer

systems programmor to assist with the development and maintenance of real-lime financial systems. Hals to develop. implement and document systems/application softwars and to provide technical support for computer operations. Twin NCR criterions are in use.

Applicants are expected to have at least 2 years experience in NCR NEAT-3 and should be farriller with NCR operating systems. Some knowledge of TP and NCR terminals would

ndividuals with similar experience on non-NCR equipment will also be considered. Salary offered corresponds to his experience and value with e.13th month and several extra-legal advantages.

Oall for more information or for an appointment n° 031/ 38.00.16 Saturday or Sunday from 14 to 15 pm. On weekdays 02/539.04.39 from 9 to 18 pm. or write under reference 80/1873 - Systems Programmer.

CERC ; rue de Livourne 75 ; 1050 Bruxelles.

HARLAND AND WOLFF LIMITED

SYSTEMS AND **PROGRAMMING MANAGER**

THE ENVIRDNMENT:

Hedend and Wolff Limited is the lergest single employer in N. Iroland, mul has an in-house systems and computer services department. The IBM 370 / 136 operates under OOS/VS and has a large interprocessing system supporting on-line user applications and program develop-

THE WORKLDAD:

We already liavo a vnry wide renge of business epplicatione in our comprohensive management information system, but arn still very much in a development phese.

THE DEPARTMENT. Our development strill comprise about 30 analysts and

programmers in 3 emplications teems, each under its THE PERSON WE SEEK:

We oller a major cereor opportunity for a competent senior meneger with good project control experience and the ability to work with senior executives of the company in the formulation of development plans for their departments. Also en esset would be good teleprocessing and detebasa experience.

An attractive salary will be olfered to the right person

Please apply in the lirst instance, to:

STAFF PERSONNEL MANAGER CENTRAL PERSONNEL DEPARTMENT HARLAND AND WOLFF LIMITED QUEEN'S ISLAND **BELFAST BT3 9DU**

leeso quote reforence number 0 on the envelope

DEPUTY EDITOR

SYSTEMS INTERNATIONAL

Europe's leading computer and digital systems monthly megezine needs a Deputy Editor to join its lively team besed in Central London. The successful epplicant must be technically competent in one or more of the following areas: systems design, olectronics, design engineering, computer science. He/she, will preferebly have some writing experience and will be required to deputise for the Editor in his absonce. Some travel is involved. Excellent pension scheme, subsidised staff restaurant, etc. Salary negotiable, but not less than £5,100 p.a.

Apply in the first instance to Frank Booty, the Editor, on 01-261 8000 or write to him at Systems International, IPC Business Press Ltd., Dorset House, Stamford Street, London SE1 SLU.

MOS is a leading computer menulacturer with solvationers and distributions throughout

The Company requires the following

Date Corner programmen Specialist candidates

should have at least three years a remove on Data Communications flow should be able to

demonstrate a working knowledge of the

* Functions of main frame

Terreteration with mer me

Post Office to day

Data Communications Specialists

Porceiliste for its UK subsidiery.

Software Sepport Specialists

MYRIADI

MANCHESTER

c. £5,750

series mechins to compliment an existing NCR Sentry Series 200 Processor. Expansion is currently being under-

taken to widen the ecops of the on-line processing and an Operations Manager is required now to control the day-to-

* Proven experience of manegement responsibilities

Ability to trenslate idoes into sction.
 Honeywell Lovel 64 series knowledge preferable though

Il you meet these requirements and wish to join a young, progressive management learn, write with briel carest details to.

DISTRIBUTION COMPUTER SERVICES

G. Aizlewood, General Menage

Highfield Road

DCSL

Menchester M19 3LN Tel: 061-224 3274

SALES **EXECUTIVES**

ON TARGET EARNING to £15.000

COMPUTER WEEKLY, June 29, 1978

To Market Financial Planning Systems to Senior Management

This major U.S. Bureau is currently expanding their marketing operations in the City. Several experienced Sales Executives are required to build upon the last four years' U.K. growth. The Company is currently supporting over 250 commercial application systems with over 60 mainframes linked by one of the most advanced communication software systems in the world.

If you have commercial sales experience, knowledge of finencial systems end are keen to develop new skills the Company offer a commencing basic selary in the region of £6,000, with quota earnings to £10,000 end target earnings of £15,000 are extremely reelistic. Further benefits include e car allowance, good conditions of employment end friendly working environment.

Ref. W3/2906

MYRIAD APPOINTMENTS LIMITED Computer Personnel Consultants elephone or write to:-30 Fleet Street London EC4Y IAA 01-353 0981 (24 hrs)

Data Control DCSL **Opportunities OPERATIONS MANAGER**

Kent earnings up to £5,000

BOC Datasolve operates a large ICL 1900 configuration on behalf of a client in Dartford, Kent. The equipment comprises an ICL 1903A and 1903T operating under manual, EXEC, GEORGE 2 and GEORGE 3.

The Data Control section works on a two-shift basis and the following positions are available.

Shift Leader

To manage a shift of six data control clerks. The need is for someone with skill in dealing with computer users, ideally developed in a bureau type environment as well as experience in planning and co-ordinating the activities of a data control team. The ability to create and maintain a high level of documentation is important.

Control Clerks

At least 12 months' experience in an ICL 1900 based data control section is preferred. The ability to communicate is essential and knowledge of the relevant ICL operating systems would be an advantage These positions, which are open to both men and women, carry an attractive basic salary, based on previous experience, together with a shift allowance Canteen facilities and free evening meals are available. Although initially based at Dartford, these positions

will provide opportunities for suitable personnel to

progress to other positions, either at Dartford or to

other ICL 1900/2900 or IBM sites within the Datasolve

Written applications, with brief personal details, should be made to Alan Burton-Jones, Regional Development Group.

BOC Datasolve

BOC Datasolve Limited, Shipton Group House, 24 Oval Road, London NW1 7DD. Telephone: 01-267 6157.

WANTED TRAINEE SALES PERSON For an insureally highly motive se young man with professional and rea set approach Ten years' expensions a destrive fivel in commercial and guid to services. Would rainer talk to people

White to Ray Scott at Box 1864

STRUCTURED PROGRAMMING

ROFESSIONALS!

We can give you at least 6-month contracte Telephone: Jim Taylor on 01-531 9131

Make Wa your intelligent choice.

A CHALLENGE FOR

AND CONSULTANTS

canterbury City Council Senior

DISCUS

Systems Analyst/

SYSTEMS SUPPORT PROGRAMMERS APB/SO1 £4343-£5065 (fact) (pay award pending)

A Casual User Car Allowance is payable

Softwarn Support Specialist candidates should have a good knowledge of high level language programming preferably on ministruo to tinga years experience essential. Applications are invited for the above pos-tion from suitably qualified and separisation. persons The Council operate an ICL 1901 A-computer at the present but this is to be replaced in October 1878 with an ICL 2903 using EDS 50, and VIDUS fished by a 7502 using EDS 50, and VIDUS fished by a 7502 using EDS 50, and VIDUS fished by a 7502 to the methicane The new computer will be housed in a pulpose built companie centuri-on the outsiers of she historicite City of Comtentury. This position offers a finishedus opportunity for a computer professional to obtain uso aprices, and also in became involved in the Council a plant for the implementation of on-line systems. MOS provides interesting and challenging stock with many opportunities for travel. In some cases, as agrimente abroad Satares will be according to experience an qualifications - up to £7,000 per anytum, plus generaus fonge bunefus that you might expect from a successful international Company

fiend trief resume to the

MDS Data Processing Ltd . 50 Vauxhall Bridge Road. London SW1V 2RT or rang the Systems Support Manager on 01 828 1288 for further details

Opverderation will be given to housing accommodation and a generous disturbance allowence scheme is in operation Closing date 7th July 1978 Interview date 176 July 1978

Application forms any to obtained from the Personnel Officer. 3 Mercawo Avenue, Centurbury. Rent CT. 20N-Talaphore: Centarbury 87768 Ext. 12.

DEPUTY **COMPUTER MANAGER** EXPERIENCED **PROGRAMMER**

£3,398-£6,065 por annum (Stage III oward pending)

An axcellent opportunity axists for a Programmer Analyst seaking a sewerding post within a targatinencial department. The Authority currently oparates an I.C.L. 190tS computer with discs and paper tape, but is now upgreding the installation to I.C.L. 2904 with EDS 80 and visual display units. The successful applicant will join a small team which will be convening and davatoping all systems for the new computer. This team will later be responsible for extensive development, especially in the lial of communications.

especially in the liald of communications.

The estary band is deliberately wide as we are Interested in receiving applications from people at all levels of experience. If the person appointed has qualities which would command a satery near the top of the acate, he or she would be given the opportunity to fill the role of Deputy Computer Manager.

As a general indicator, we are seeking applicants with sound experience in any of the following fields, programming in COBOL and some systems design. GEORGE 1/2 Operating system, 1900/2900 environment, Communications. Local Government background, Applications Manager.

Removel expenses and generous relocation expenses will be paid in approved cases.

paid in approved cases. For any further information, please ring Mr. J. Cherleson on Langley Mill 66151.

Applications (no application forms) to be sent to the Personnel Department, Amber Velley District Council, Held Head House, Chesterfield Roed, Belper, Dorbyshire DES 1FE, within the next seven days.

GRAMPIAN HEALTH BOARD

Post of

COMPUTER SERVICES **OFFICER**

The Board wish to recruit a Computer Services Officer on the selary scale £8,955 rising by five annual increments to £8,423 per annum. Candidates should have extensiva expanence of computing in sizaable inetailations with the ability to control systems design, programming and operating staff. Knowledge and experience of delabase managamant systems and financial and budgetary sarvices are desirable requirements. The duties and responsibilities of the post extend over all espects of computer services and developments relating to health care services and knowledge and experience of the health service would be a considerable adventage,

Forms of application and further particulars of the appointment may be obtained from the Area Personnel Officar, Grampian Health Board, 1-7 Albyn Place, Abardean AB9 1RE, with whom completed applications should be lodged by 29th July, 1978;

LONDON BOROUGH OF HAVERING **FORTRAN PROGRAMMER**

Te join a feam working on the development of a nuchina indepe computer managed learning system used in caveral UK centres. The Court has 3 x HP 2100 Computers using RTE4.

The successful candidate will join a small friendly protessional learn and be required to assist with the specification and enalysis as well as

programming developments.
Emphasia is placed upon the ability to work independently, communicate with the team and produce good qupility programs in standard PORTRAN IV to agreed deadlines.

AP 374 Satary \$3.818.64.289 plus 596. Phase 3 oward expected 1st

Application forms sed further details sveliable from: The Educational Computer Centre, Tring Gardege, Hareld Hill, Romford, Essex RM2 8QX. Tel: 04023 49118. Forms to be returned by 12th July, 1875.

. £4000 to £6500

The Royal Borough of KENSINGTON AND

CHELSEA

CONTROL CLERK

SHEFFIELD CITY DEPARTMENT OF COMPUTER SERVICES SYSTEMS PROGRAMMER

Water the Computer Services Department is based on the Pond Street Site campus which as in the heart of Steel-Seld City Certies. The Polyrectric can efter apportunity for promotion to concludes who wish to supposed. Applicants should preferably have a sound knowledge of IBM Equipment, of 0 S V S I and of Assemblyt programming. The successive candidate will exert in the Computer Systems Sequent and will be nepolabile to the Project Leider for the Immediate of the Polyrectric Systems and will be nepolabile to the Project Leider for the Immediate of the Immediate of

An enthusialic person required to form for Computer Operations Department to the Computer of t 370/136
Seley Seele, 135/29-1328/2 plas suppliaring of £31/2 and 5% pay award.
Requisite for an application form inwriting only please, to the Recruitment Section of the Personnel Department Section of the Personnel Department (Shefriqle City, Folytechnite (Department), Hallords Hosse, Fitzalen Scienter, Shefrids 218. So where compidied (infraselected to make the second beautiful to the

000000000 ENGINEERS D

£7000+

OPERATORS
D SINCE AND CONTROL OF D 11862 01 995 3883 D D 1868 01 995 3883 D FREEPOST LONDON W4 3BR | FREEPOST LONDON W4 3BR

Employment Agency Act No. SE(A2648)

Evening/Weekend, Sara Smith Tel: Weybridge 40989

CONTRACT REQUIREMENTS

£150-£300 p.w. + expenses where epplicable

370 O.S. Cobei H-W GCOS, IDS, Cohol Liverpool Analyst with Construction industry Experience Croydon Mark IV Progremmers 290 3 Coboi + Date Bess with Fivent German Hemburg Analyst with inventory Control Experience P.L i or Cobol West Midlends 370 O.S. IMS Cobol West Midiands 1900 Cobol and Pepertepe Experience Sevenoaks **RSX 11 Fortren** Reading Hewiett Pecerd 3000 Assembler North West Analyst with Banking Experience/2903 Cobol PL 1 IMS Tehran Singer 1500 Assembler North West Sys 3 RPG 11 North London and Essax 1900 G111 Cobol Programmers Kuweit PDP Besic North London Cobol, Any Mechine + Fluent French Peris

COMBYTE SERVICES LTD. 11 Stemford House, Stemford New Road Altrinchem, Cheshire

OMBYTE Telephone 061-941 4509

Evening/Weekend: Deve Hedley 061-440 0408 Employment Agency Act. No. NW419

COMPUTER **OPERATOR**

Our cliant, a commercial Kilohan Manufacturing company, pert of one of the country a leading commercial aniarpiles. Is currently using IBM System 3 model hardware, and is seeking a Computer Operator. The successful applicant should have at least 12 months' relevant expansions, ideally but not seematicity, on IBM System 3.

No shift work is involved

He or sha will join a Iriandly, young dapanment and benefit from stelf discounts on the group's products, a stell canteen. A weeks' peid holiday — salary dependent

Meteor Computer Consultants Ltd.

Barry House, 20-22 Worple Road, Wimbledon, London SW19 4DH Telephone 01-946 4424

Systems Support Professionals

ITT Business Systems, European leaders in computer based data communications, need experienced systems support professionals to fill new positions based in their Dietriot Ragional Offices at Manchester and Kent.

You should work closely within the Systems

Support Group giving software and leatinical support to the Balse Force, We would exped you to have at least 4 We would expeal you to have at least 4years' computer experience, two of which
should have been involved in experience and
TT' application. We would be particularly
interested to hear from people currently
working as systems engineers or systems
programmers in any IBM teleprocessing
environment.
We are making a considerable impact in
the data communications market with our

established 3280 family of interactive terminals, and have recently sourced sophia scaled additions to our varied range such se the IBM compatible 3805 Programmable

Our sataries reflect the importance of Our salaries reflect the importance of these positions and a choice of Company Carwould be given plus excellent frings benefits. If you are interested in discovering more about these positions telephone Bill Bain, Systems Support Menager on 01-440 4141, ext. 410 or write giving brief career details to Mrs. F. Meson, Parsonnal Officer, ITT Business Systems, Diversey House, 1A Chalik Lane, Cockfosters Road, Bernet, Herts,

ITT Business Systems

CONTRACT **BUSINESS SYSTEMS ANALYSTS** DNA

PROFESSIONAL CALIBRE

COMMERCIAL PROGRAMMERS (COBOL, RPG, BAL, MARK (V)

raquired tor

DEMANDING AND REWARDING LONDON-BASED PROJECTS

Please telaphone or send cereer details to

MARGARET DRISCOLL

TANGENT COMPUTER SERVICES

BROOKHOUSE, 6 EASTERN ROAD ROMFORD, ESSEX, RM1 3PJ

TEL: ROMFORD (STD 0708) 44181/2

Licensed ennually as a business and employment agency.

SE (A) 1032

EDINBURGH REDIONAL COMPUTING CENTRE **DATABASE OPPORTUNITIES**

The Centre has three new posts in its Detabase Systems Unit for Computing Officers to work with Data Base Management Systems (DBMS)

Computing Officers to well with Data Bess Menagement Systems (DBMS)

Currently, the main computing services offered by the Convolore betch services on an ICL 298D, turning under VME78, and OS/MVT accessed terretty at the IBM 3707159-360765 complies at Nowcestle University, and the intersetive Edinburgh Mulli-Access System (based on a twin ICL 4-75 installation).

DBMS work at the Centre is principally concerned with IDMS, the abbreviation for ICL's integrated Date Management System IDMS is an implementation of the database beging prepased by CODASYL and consists of a sitile of sativative comparions which hamile the astablishment, precessing and administration at a database. At the Centre, o FORTRAN Interface Sub-System (FISS) has been developed (anabling FORTRAN pregnents to access IDMS facilities), and successful applicants will work an illa maniferance and development of FISS on a variety of computers.

Condidates may also like to be considered for a potential post of the Advisory Sorvice represents infoculation within the Centre where uses certains qualities logisting infliculties rubuming to the provide controls.

cen laise quales regarding difficulties relating to the irse of the Controls main services.

Applications are invited teem graduotes (in final year students) with some computing experience, not necessarily of any of the above systems. The appointments which are for the bride instance, will be in the Assistant Computing Officer across with significant relevant experience. Computing Officer scribs, with supplicant relevant experience. Computing Officer scribs, with supplicant relevant experience. Computing Officer across with Superannustion under USS. The curtors scoles for Assistant Computing Officer and Computing Officer are Cit. 180 - E4, 1907 and 13, 050 - E9, 178, respectively.

For further details and an application form context the Secretary. University of Edulotrigit. The Old College, South Bridge, Edulotrigit 8 (quoting releaded 70.17) to whom complained forms should be interned by 20th July, 1878.

LONDON BOROUGH OF WALTHAM FOREST

Borough Trensurer's Department Programmers &

Systems Analysts Balary up to E8,350

There are lew jobs which ofter the variety of computer work that exists within Local Government. Waithem Forest can ofter you that variety. We have vecencies in our Systems and Programming division, which uses modular programming under GEORGE 2+. You should be an experienced COBOL programmer, and opportunities exist for an ambitious person to gain experience in the systems field.

A 38-hour week with flexible working hours is in operation, no shift working and 4-8 weeks annual holiday depending

For further information telephone Rey Brown (8.30 e.m. - 6.00 Mon.-Fri.) on 01-527 8844 ext 334 or telephone 01:831 8889 (24-hour answering service) for application form and further particulars.

Closing date: 14th July, 1978. Please quote Rel: 51284.



PROGRAMMER

PROGRAMMER

The Computer Centre requires a graduate (or equiretent) with axperience of programming in easimbly code and a high-level innuage to easie in the realistic rence and development of systems programs under GEDRGE 3 on the University a large 1904S. Selery on the scale E3,189 C4,601 p.s.

Apply 'giving desaits of qualifications and experience and remies of two referses, quoting Ref. M.E. 45A, to Assistant Sursar (Personnel), University of Reading, White-knights, Reading RGS ZAK.

contract opportunities for experienced programmers Register with an International Software Organisation

Gemini Contracts **EUROUK**

Tel 01-828 6634 Home: 01-274 1293



Call (0628) 29456 You could earn £20,000 a year!

Salesmen and future salesmen.

Cincom* Systems is looking for you, if you have marketing experience related to data processing systems, if you are a DP manager, project leader or senior analyst interested in marketing as a future career!

The demand for data base management and data communication systems, coupled with internal promotions, has created new opportunities for further marketing personnel within the U.K. and Europe.

If you are already a successful salesman within the data processing industry, or feel you could be, we would like to talk to you about high salaries with the industry leader; about a big company benefit package; about possibilities for contact with the most important d largest enterprises in the U.K. and Europe. Above all, about promotion opportunities within the fastest growing software organisation in

Cincom Systems is looking for you.

processing techniques is necessary, and we as the leaders in this field can teach you everything you don't already know about DB/DC. Pick up the phone now! Can you afford not to?



Clinicum Systems Invernational S.A. St. Ives House, Maidenhead, Berkshire SL6 (QS. Oslices In: Basel, Copenhagen. Oberursel Germany, Oslo, Paris, Stockholm. 2005 Charles Seem first Dec. All rights reserved. Unform, and 😝 are tendemarks of Chicom Systems, Inc. U.S.A.

Micro and Mini Computer Systems & Mainframe System Software Development

The UNITED KINGDOM ATOMIC ENERGY AUTHORITY'S ESTABLISHMENT at WINFRITH, which is silvated between BOURNEMOUTH and WEYMOUTH in DORSET, has vacancies for

SCIENTISTS, ENGINEERS & MATHEMATICIANS

system sortware for maintaine computers.

The Establishment is amongst the largest users of computers for résearch and development programmes. Currently in his a maintraine duel ICL System 4 computer on sith and tricks for elsewhere in the UKAEA. There is a continuing programme of inputaining the Authority computer capability.

Micro end mini computers are used throughout the site, demands for now applications of systems are constantly arising and a front-end mini-computer system which will link the site terminal network to the maintaines is under development.

For mainframe system software meintenance and development experience of ICL 470 system software would be an edvantage Candidates are normally expected to have good honours degrees in expensive or subjects and suitable post-greduate experience, or to have corporate membership of relevant professional metrutions. Appointments will be made to the HIGHER or SENIOR SCIENT IFIC OFFICER GRADES

SCIENT IFIC BFFICER GRADES

HSO Salary Range £4,389 — £5,829 pa
SSO Salary Range £4,380 — £7,300 pa
SSO Salary Range £5 £1.1 — £7,300 pa
Iraveling distance under normal Authority arrangements will be available to a married officer living beyond daily
Iraveling distance.

Applications to FREEPOST, APPOINTMENTS OFFICER, AEE WINFRITH, DORCHESTER, BORSET, DT2 8DH.

CONTRACTS

At least 2 years' OPERATIONS experience?

If you are a freelence operetor now, or intend to go freelence in the near future, contect us for deteils of our current end future assignments in ell erees of the U.K.

IMMEDIATE

IBM DOS GRASP OPS BURROUGHS 1700 OPS IBM SYSTEM 3/15 OPS ICL SYSTEM 4 J 1800 OPS IBM DOS POWER OPS ICL 2903 OPS IBM OS VS2 OPS DDE/PUNCH/VDU OPS

FORTHCOMING Honeywell OS 2000 Ops & Senior Ops & Shift Leeder for one year Contract TOP RATES + BONUS

ICL G2+ & G3 OPS **HONEYWELL GCOS OPS** ICL 2960 VMEB OPS

PHONE 01-439 6481 (24 hour enswering service) for more information or send the coupon below for immediate ettention



EFFECTIA GRAVIS
NATIONAL HOUSE, 88 WARDOUR STREET, LONDON W1V 3HP
COMPUTER PERSONNEL CONSULTANTS LICENCE NO. SE(A)62

OPERATORS

(BLOCK CAPITALS PLEASE)

Complete the coupon and return to the eddress below, for your next PERMANENT or CONTRACT inh

elephone: Home: Type of Transport Date of Birth Current Position
(Contract/Parmenend delete)
Sefery/Rete Position Required Contract/ Permissions delets Selary/Rate Notice Required/Date Available (delete) Areae Preferred: First Choice Second Choice Experience to date: (Leet Position First)

Company: Name
From To
Hardware Oparating Systems/ Software with feet Min Year Operating Systems/Software

BOOK BUILD

EFFECTIA GRAVIS NATIONAL HOUSE, 66 WARDOUR STREET LONDON W1V 3HP. 01-439 6481 (24 hours)



Senior Systems **Analyst**

To £7,000

HOME COUNTIES

This is an exciting opportunity to join a small team at an early stage in its growth. Plantation Holdings operates a PDP 11/70 at Staumore providing emote on-line processing to companies both within and putside the

The successful applicant should have a minimum of five years computing experience with the emphasis on production, commercial and financial applications. Two of the first assignments will be for Group companies designing a production scheduling and work-in-progress reporting system.

The position will involve travelling to locations mainly in the Home

This is a senior position with excellent prospects of early promotion. For further details and an application form please contact:—
Ames Personnel, Suite 14, Dryden Chembere, 119 Oxford Street, London,

PERSONNEL 01-434 1106

National Coal Board Mining Research and Development Establishment

The expanding programme of the Establishment covers research, development and testing in all fields of engineering and science. This year the Establishment is recruiting additional personnel to increase the effort in key areas of mine productivity and safety.

As a result of this expansion, there are vacancies for

MINI-COMPUTER **ENGINEERS AND SCIENTISTS**

The National Coal Board has embarked upon a programme of applying computer based monitoring and control systems to mining operations. This challenging and rewarding field of work is rapidly expanding to include coal face monitoring, coal transport systems, and monitoring the underground environment.

Applicants should be qualified in Electrical, Mechanical or Systems. Engineering and have experience of monitoring and control systems. They should preferably be experienced in the use of mini-computers and microprocessors operating in real time.

The sterting salaries will be in the range £5,000 to £6,500 according to qualifications and experience. Attractive benefits include nearly six weeks

Please apply to the Staff and Administration Manager, quoting reference no. 740.

National Coal Board, Mining Research and Development Establishment,
Ashby Road, Stanhope Bretby, BURTON ON TRENT, Staffs, DEI 5 0QD,

AND DEVELOPMENT ESTABLISHMENT



Temporary Lectureship in Computer Studies

Applications are invited for the post of temporary LECTURER in the Department of Computer Studies. Profesence will be given to candidates with experience in data processing, machine-cade programming or logic design. This appointment will be for a period of one year.

Further details may be obtained (quelling relevance L&W.A) input the Establishment Distart Untwinted House California, LA1 4YW, to whom applications 15, copies), naming 5 relaises, should be sent riot taken then 21 July, 1678.

SALOP COUNTY COUNCIL SENIOR SYSTEMS PROGRAMMER

Salary up to £6,097 per annum (Phase 3 pay award pending 1st July, 1978) This is a new post to head a small team which will be responsible for the evaluation, development, implementation and maintenance of all

systems activate. Implementation and maintenance of all systems activates. The Council operates at IBM 370/128 computes with a substantial remote terminal network which provides a sewice to both County Departments and Olstrict Councils. VM/370, DOS/VS and OL/1 are in use. A major new development program is being undertaken, and there will be autostantial enhancements to both herdware end schwins. The peak will be substantial enhancements to both herdware end schwins. The post will pley a key role in their development:

Salop has planty of cheap housing in predominantly rural surroundings, and generous assistance with tempvel explanes. With be livery if, approved cases.

Applicants will need to be technically compatent, highly mativated end thrive upon responsibility. Although any necessary training will be given, experionics of sems of the following would be an advantage other TP monthors.

Application forms and tumber devale can be observed from the County Treasure. Births will be strongly of the plant of the plant of the strongly of the plant of the seminary of the strongly of the seminary of the seminary of the seminary of the seminary of the seminary. Shrawsbury 2222351 returnable by 12th July 1978.

MYRIAD **APPOINTMENTS** LIMITED

Computer Personnel Consultants

SYSTEMS & PROGRAMMING PERSONNEL

C. LONDON

Extendinal equationalities exist for progrid know to progress their careors within en-expending international Compuny providing mange of computer services to the oil industry.

Industry
The certifial systems from as responsible for developing group systems distributed to extracts D(P) controls. Major development plans include the introduction of a Database on the IRM 3.707/125 and IBM System 34 computers at sites throughout

ANALYST

To design and implement systems, the Analyst will possess a programming background coupled with analysis experience on at least one major system. The person appointed will function as a team leader on certain projects.

ANALYST/PROGRAMMERS

To £7000

Thu Analyst/Progremmer will hold responsibility for systems penaining to one cverseas subsidiary. Cendidetes should have a sound COBOL background with proven analysis experience along with the ability to liaise with line management.

PROGRAMMERS

£4500 - To £6000

Applicants should offer a minimum of 12 months' COBOL on any mechine and display in matrix expression, being particularly willing to accept additional ra-

The company offers genuine career prospects, non-contributory pension scheme season tacket lean, LVs and 4 weeks' holiday. Rel. S1/290B

> 24-hr. answering service Please telephone for a confidentiel discussion or write to:

> 30 Fleet Street London EC4Y 1AA 01-353 0981

Lift and Crane Surveyors & Head Office Engineers

British Engine is a leader in the specialist field of engineering insurence. It is subsidiary Company of Royal Insurance and has its Heed Office in Menchestor.

LIFT AND CRANE ENGINEER SURVEYORS

Menchester, Reeding, Humberalde, Invernese end N.E. Coest

Applicants with HNC or equivelent quelifications should have experience covering the manufecture, crection end meintenance of lifts, cranes and similar machinery. Responsibilitios after training will include the examination of lifting and handling mechinery to eletutory and other purposes. The successful applicants for these positions will be based at home and have the benefit of a

HEAD OFFICE ENGINEER

Mancheater

Applicants for this position need similar qualifications and appropriate work experience to the above appointments including work on electrical inetalletions; the manufacture, erection and maintenance of lifes, crones and almiler machinery Rosponsibilities include the provision of an effective Inspection and reporting service and involves training and general supervision of Engineer-Surveyore, together with eccaptence of tieks end settlement of claims. Hexible working hours and good office conditions.

The work is varied and interesting. Saleries are competitive and include immediate oligibility for edvantageous mortgage facilities (31/2% on first £10,000) and non-contributory pension

Please write to Mr J. Berher, British Engine, Longridge House, Manchester

British Engine

British Engine Oailer end Electrical Insurance Company Limited.

OVERSEAS POSITIONS

Upenings presently exist for OPERATOR TECHNICIANS to work in foreign locations on mini-computer based system data processing systems. Successful applicants thould have H.N.C. or military equipment, with at least one year's experience working with mini-computers and peripherals.

> Send Jesume to JANET MITCHELL Western Geophysical Company 268-290 Worton Road, Islaworth, Middlesex



Data Processing Recruitment Consultants

Mini Programmers & Designers **Netherlands**

Salary: to £16K

We are retained by a U.S. mini-computer manufacturer to recruit mini-computer Progremmers end Systems Designers for Its Dutch subsidiery. Candidetes must offer three years progremming experience specifically on one or more of the

> DEC PDP II DG Nova/Eclipse H.P. 3000

Nixdorf 800/8700 Whilst in respeat of the 'design' positions Commercial experience in a feesibility, dosign and subsequent implementation capacity is essential. The

Company offers e rare opportunity for career based positions within close proximity to Amsterdam. The package includes periodic project bonuses sickness, medical benefit end pension schemes, luli re-location expenses for either single or married personnel, re-imbursement of initial eccommodetion expenditure, travelling and site ellowances. Additionally there will be an opportunity to re-locate to one of the Company's EEC or Stateside

Initial interviews will be held in the U.K. after which short-listed candidates will be esked to spend one day in the Netharlends for final selection.

Real-Time Software E.E.C.

Salary: £10 - 16.5K + Outstanding Benefits

When it comes to State-of-the-Art Real-time Mini Softwere our client defers to no one. They ere

Internationally regerded es 'technicel frontier pushers' end es a velued project-teem member you will shere their prestige end eccleim.

To meet e continuelly phased growth programme our client is establishing severel new project teems requiring Consultents, Project Leaders, Anelysts end Programmers. The letter will be well versed in

Assembler end the former will either be greduetes or have extensive relevent experience in ileu.
Willingness to re-locate for a meeningfully extended period to one of the most desireble E.E.C. locations ie important. Every essistence will be given to candidetes end their femilles in re-location, interviews will be held in London early in July end

offers mede within 7 days.

IMS Data-Base London + E.E.C.

Salary: to £9K (U.K.) to £16K (E.E.C.)

Our client one of the 'Seven Sisters' Oil Companies has osked Logistix to assist in recruiting e number of IMS Date bese specialists up to project leader level and beyond. The only pre-requisite incorporated in our brief is that condidetes are able to

demonstrate solid IMS Date base skills.

DL/1 is of course essential and in combination with PL/1, COBOL or Assembler will be of considerable Thie company is amongst the most advenced end sophisticated users of D.P. and should be regarded for its long-term career potentiel rather than as e

stepping stone to greener pastures.
Fringe benefits normelly associated with a Major
Oil Company are offered together with other
rewards of a more unusual nature. These are of course in eddition to well above evarege ealeries.

Mini Cobol — U.S. Bank **City of London**

Salary: £5.5K - 8,5K + Mortgage

One of the World's most preetigious U.S. Banks with European Heedquarters in London end region-el locations in numerous European capitels is expanding its sizeable Dete Processing activities by introducing e ranga of sophisticated Mini comp-utars to enhance their IBM 370/168 systems This new phese necessitates the recruitment of numerous senior personnel including Project Manegers. Team Leeders, Senior Analysis and

seasoned Progremmers under whose combined skill the bank propose embarking on this ambitious

In perticular MINI-COBOL are a programming language is essential and relevant experience possibly in finance or Benking will be especially welcome. These openings cannot truly be regarded as jobs thay must be seen as career building oppor-

Systems Designers + Programmers etc. Cheshire Salaries: £6 - 9.5K (d.a.e.)

A very prestige client with headquarters in the Home Counties and regional offices losated at Macclesfield and throughout Europe, urgently require the following key personnel:

Rasi-time Programmers, Systems Designers & Compiler Specialists with 2/5 years experience. Of particular interest would be people with relevant experience in one or more of the following areas: Farranti ar DEC with Basia RTLII or Corel and IBM or ICL with Assembler.

The scope of projects is both broad and demending and certainly in keeping with the international prestige of this allent - you will play en important role in project development and the opportunity to enhance your technical expertise is one of the ettributes of working with this reputeble group. Fringe benefits ere well above everage and full relocation expenses will of course be met. Interviews can be held in London or Macclesfield to your convenience. Rei 15/E

Logistix, Freepost 32, London WIE 3YZ 01 491 4636 Telex 28800 (Reverse tharget)

Avon House, 366 Oxford Street, London WIN 9HA

For a lerge commercial inclellation, able to communicate at all levels for ISM 370 knowledge of ASSEMBLER an adventage.

SYSTEMS ANALYST

£5,500-£6,000
Must heve deck experience, low lavel essentibler, reel time

PROGRAMMER

E4,400
ISM COSOL DOS/VS CICS experience proformed Expending

PROGRAMMER

£4,250 + bonus
ICL COSOL for lorward looking compony. Expanding instelletional development work, no meintanence.

73/75 ALBION STREET 0532-36622

65 PRINCESS STREET 061-256 4593

MANCHESTER

PROGRAMMERS/

DESIGNERS

To £6,500

One of the lergest softwere houses in the UK are leaking for technical programmers with roel time mini experience using ASSEMBLER or COSOL.

SENIOR PROGRAMMER

To £5,000

Progremmer with 3 years' commercial expanionce on madium to lerge systems using COSOL Knowledge of PLAN would be an edvantage.

PROGRAMMER

£4,000 +

Any mini experience using COSOL or ASSEMBLER. Sonus Iwice yearly, paid ovenime, subsidised mollgege, lunch allowence, and non contributory pension schema

ANALYST

To £6,000
3/5 yeers' experience in commercial business systems with responsibility for excess one medium system from feesibility to

SHEFFIELD PROJECT LEADER £6,500 + REVIEW JULY

With at least 5 years' experience in DP. Conting through programming and systems analysis ronk. Sall-motivating and staff control a must. Able to converse at all lovels. A demanding position in a lowerd looking business environment

PROGRAMMER

£4,200

COSOL programmor 1½-2 years experience in commercial application on 1900 salice prosently being indepted. Survey

ANALYST/ **PROGRAMMER**

£5,300
With 2 years' ecientific epplication on minis, ASSEMBLER, FORTRAN, COSOL, RTL 2, or manufacturing divironment. Small

ANALYST/ **PROGRAMMER** £5,400

COSOL ICL saries. Oate bese anvironment. 2 yeers' commerciel exporience, user lieison, on-line batch instellation. Excellent

54/56 FARGATE 0742-738783

IF THE JOB YOU REQUIRE IS NOT HERE — PLEASE RING OR CALL IN AT ANY OF THE ABOVE BRANCHES — WE ARE HERE TO HELP YOU IN 1978

LEEDS

BERTRAM COMPUTER PERSONNEL SHEFFIELD **MANCHESTER BIRMINGHAM**

A Division of BERTRAM PERSONNEL GROUP LTD.

COVENTRY

COMPUTER MEDIA SALES

To be successful in today's computer media market you have to sell the best. Our. client provides the best. Peliken line printer ribbone, Grahem Epoch 4 computer tepes, discs, flippies, flopplee end e first-cless renge of P.F.E. end Chubb equipment. Why settle for less? Our client is offering you the chence to join hie elreedy successful selee teem on a generous besic selery, high commission earnings, e prestige compeny cer. They will even allow you to wine and dine e different client every week, ell expenses peld. If you have some experience of computer medie, either through sales or machine operating, give me e ring todey on 01-446 3513. Greham Blyth, Ven Rynn Associetes, Recruitment Consultents.

HARROW COLLEGE OF HIGHER EDUCATION

Part-Tima Day and Evening Courses in

BASIC COBOL FORTRAN

Commencing Saptambar / October 1978 Programming Courses
Department of Businaes and Sociel Studies row College of Technology end Art Northwick Park Harrow HA1 3TP

ROCH CALL PROGRAMMER

Treasurar's Department The present installation comprises an ICL 64K t 9027 with tapes and disce and communications equipment which will be replaced by on ICL 2960 system leter this year.

Substantial development of on-line systems is planned. A knowledge of 1900 Cobol is destrable.

APPLICATION FORMS available (by quoting Ref. No. 8.681) from the Chief Personnel Officer, 166 Drake Street, Rochdale OL16 1XG, to whom they should be returned by 3rd July, 1978.

PROGRAMMERS

£5000 to £7800 FREEPOST LONDON W4 3BR

LECTURER I IN COMPUTING, STATISTICS AND MATHEMATICS # qualified leacher in required from 1st Beprember, 1978, to sech this least up to GCE 'A' and O N.C. level, A knowledge of the applications and the bearings and the second sections are sections.

10 man 01 995 3883 [2]

DATABASE ANALYST for a City Bank Except + Bantefits

Successful IBM Professi

IMYRIAD APPOINTMENTS LIMITED

Computer Personnel Consultants

South America, Europe end the Far East is seaking additionel D.P.

with the implementation of naw systems at the Division's Manufecturing Haadquarters and oversaes. The vacencies offer the opportunity of travel abroad for ahort durations with genarous llowences being provided.

Anelysi / Progremmers will have the opportunity of joining project teams and be estively involved in applications from feealbility study Implementation. A aound COBOL or ASSEMBLER background aupported by experience of one mejor system implementation: ere prime requirements for success in this role.

PROGRAMMERS

The company, which operates an IBM 37D, supplement thase exolting opportunities with 4 weeks holidey, FREE BUPA membership, generous relocation expenses end other fringe benefits.

24-hour answering service

Pleese telephone for a confidential discussion or write to:

DATABASE MANAGER -**PUBLISHING INDUSTRY**

- Supervising Data processing operations for nowly croated on-line Databasa.

worldwide chemical industry (vin the ADP

- Programming experience which can ba

Business minulal approach to sail and davelop computational publishing

who wishes to build his/hur caraar. Plaosa state



WE NEED a Computer Operator for our UNIVAC 9480 series computer. The computer is to be run on a shift besis.

WE REQUIRE a person with at least twelve months' operational experience UNIVAC computer experience would be an advantage.

WE OFFER competitive saliny rates, shift allowance, good working conditions and pond prospects for promotion to the

Pleasa soul your personal lustory to

Mr. R. Jeokean Data Processing Department MANCHESTER LINERS LTD. Monchester Liners House
Port of Menchester, Manchester MS 2XA

Introducing and selling on-line detabase to

Applying commuter techniques to new publishing projects and other database devolutionits

The requirements

doveloped "nn the job"

The job will suit a young unit anthusiestic person salary raquiroil in c.v. by writing to:

Dr. E. Mullor, Publishing Director, Room CP 128, IPC industrial Pross Ltd., Dorsot House, Stamford Siraai, London SE1 9LU.



Your main rasponsibilities will include:

* installing CPP products of cliant sites and providing technical training

* providing lachnical pra and post-solas back up to our diants and sales leam

* giving lechnical training to solesmen

* prasanling our products to user groups and seminors

Probably in your early twentias we would like to hear fram you if you are already working in a solas support rola or hova 1-2 years' expanience in OS systems programming with another 2-3 years' programming, operations ar systems analyst axpananca. You should be a salf storter who would anjoy dealing with people in

Although based in London you will have the opportunity to trovel widely throughout the UK.

In addition to at least 4 weeks haliday, other benefits include staff mortgage service, season licket loonschama, group health insurance and regular solary and promotion reviews. Removal assistance is a voilable where appropriate.

Interested? Then please write or telephone quoting reference CW/1163 for on application form and a copy of our Recruitment Brochura to:

Nigal Still, Racrullmeni Officar, Computer Analysts & Programmars (UK) Limited, 14/15 Graat Jamas Streat, London WCIN 3DY. 14/15 Grad Jamas Streat, Loring 14/15 Grad Jamas Jam

Software Specialists

Wore the largest independent supplier of Remote Hatch furnitude in the world and in just 8 years our parent company in the USA has been established amongs! the "Top 25" computer manufacturers.

We have recently introduced the Model 80 socies, a range of multi-function data processing products that will further enhance our reputation. We are looking for Senior Systems Engineers for this new product line - people who understand systems architecture and can undertake the responsibility of generating new systems software to meet the demands of the 80 acrins products.

This men ur women we need should have a minimum of 5 years experience and should have a systems bisa. A knowledge of IBM eystems and High Level and Low Level languages is essential. At least 3 years' experience should he in the area of applications. Real time expariance on 3270's ur similar is necesanry.

These are ilemonding jubs requiring a great deal of expertise and dedication. You'll have a back up team of three and repurt direct to the Product Support Manager, Snlaries are high and the employment package outstanding. There are only a faw people who could handle these jobs. We hope that come of them are reading this advert now

Give us your wealth of Industry experience and we'll give you ours

DATA 100

f ontact Mike Bell, Parsonnel Officer, Data 100 Ltd. Maxted Close, Hunel Hampstead, Herts HP2 7EG Tel: Hernel Hempslead (U442) 61261.

Opportment of Clinical Chamistry Wollson Research Leberatories Queen Elizabeth Medical

SCIENTIFIC PROGRAMMER

A Selantille Programmer is required to Join a small team of computer scientials responsible to routine and research computing within this laboratory. Herdware, upon which the work is based includes a POP 11/40 RSX-11M aystem, a POP 11/40 RT.17 MettiBasic system, a OG Nova 2 ROOS and a DG Nova 2 RTOS system.

socientic degres although two 'A levels, one of which is in Malha matics, will be considered. Some experience of Fortran Programming and Interest in operating systems and its management is desirable.

Sterling selery will be either £2991 per annum or £3488 per annum, depending on qualifica-

Application larms and job de-scription available from the Per-sonnel Officer. Queen Elizabath Hespital, Edgbeston, Biranisphan 815 2TH. Talephone O21-472 1311: The cosing date far receipt of completed application larms is 10th July.

Nene College Northampton_ Computer Manager

Balary Goal a APE 2424 4-248 t is under review?
Applications faril, invited for the above opt which fails yearni on 1 July 1878. The Confin has an ICL, 328, 2903 with 7802 1-9, providing a dual Babeto Real Jace sayles to some 30 educational setablishments throughout Northernationalist.
The applicant (male of temble) should pointing have a rehidure of two A lights of their education and have a sayled year commencial experience in extraord advantage of the control of t

both parties.
Above all the sales manager must hold the res-pect of his men. This cannot be generated by simply being stronger and smarter.

manager, particularly one pect becomes tarnished new to the job, is establishing a balanced the drink-after-work syn-relationship between his drome it does not make any subordinates and himself. sense at all for a sale: Should he take an auto-cratic stance and surround both a mentor and "one-of himself with "lightweights" the-boys." or should he have a team of lt is a much overlooked aggressive "high-flyors"

COMPUTER WEEKLY, June 29, 1978

How to keep a

with the staff

man's polson.

rarely makes good cover.
The nature of this mon/

dom works effectively.

Having said all that, few-of these extremes of perso-nal atyla and selling en-

vironments apply in abso-lute terms. There is always a need to "trade-off" one

ageinst the other. This is, particularly true of the

relationship between the

sletant in business and

social terma if a credible

resulting in real success, for

THE SALES BIT

good relationship

problems for a sales circumstances in which res

fact of life that any form of and operate in a domocratic leadership must be seen to style? It all depends set a mun opart from other whether you prefer quotapeople. His reliability, experience and industry must performance hassies to people hasslesi

Of course, a sales

monager seldom finds himself starting from scratch
and, therefore, his team has effectively been chosen for him. As far-os management style is concerned, it is not perience and industry must be exemplary. This is unlikely to be achiaved by out-drinking, out-swearing and out-joking the troops and making light of the ruined evening meal and the style is concerned, it is not home. Worst impressions style is concerned, it is not home. Worst impressions raally a queation of chaice. have a habit of bacoming an One man's meat is another epitaph.

man's poison.

Even worse is the dreaded
To sustain personal office party, the annual credibility with his sales- event where the programmen, a manager must mers lobby the directora operate in a style which and the aalesmen revea comes naturally rather than contrived; one which is matter how Bacchanalian within the bounds of his the Yuletide argy, a capability in physical, manager has to remember emotional and technical that coma January 2, he needs to have preserved Anything else is an in- those qualities which will vitation to fallure. Salesman enable him to hold tha res

are very good at identifying pect of his team.

On the other hand, a sales manegar who totally isolates himself from his sales force is inviting pro manager relationship is blems of a different, and no alfected by many factors: less destructive kind. The the size and nature of the man/mansgar relotionship the size and nature of the sales team; the duration of the solling-cycle; the maturity end experience of the selesman; the personality of the manager, and so on.

The size and nature of the man/managar reiotionsnip has much to gain from occasionel social exposure it is simply a matter of being with the boys — not of the seles manipager's in-

So on.

Having accepted the starting point of "To thine consider is the nature of the sales manager is in the selling anyironmant.

Only a small proportion of the sales manager's interaction with his salesmen is at the social level; mostly it is in the field and in the office. The aame rules apply. The manager must be aware of the image his actions and the selling anvironment. The manager must be aware in the case of high of the image his actions and volume products with a attitudes create, tt is so aas long salling cycle, deman-ding austained effort on a team basis, without regular fortunate manner, and lack

manifestations of sales suc- of consideration to personal cess, a totalitarian etyle sel- presentation. Having said that, one has There is too much "living to realisa that the most diftogether too long" for a ficult thing in the world is to feudal management style to be objective about oneself. Evan a mentor needs a mentor for "the onlooker realisation and statement of the came to the

selling-cycle/low value pro- sees most of the game." ducts; particularly where a large salesforce is involved, demand an "up front" style of laadarahip and a firm, strength to see ourselves as control of performance. De-mocracy and altruism are read it on the bac often agen as weaknesses in of a matchbox.

Puzzle answer

SINCE the dimber walk downhill three times as fast as ha walka up, the "times taken" must also be in the sales managar and his se- same ratio-41/4 hours up leamen in the context of the and 1½ hours down So disvarious circumstances, in tance travalled is simply which they have to interact: (4½ × 1½) + (1½ × 4½), it must at all times be conwhich equals 13½ miles.

understending is to axist NOW Office

SMALL business system sup-pliers Scope Data has opened a new office in Nottingham to replace its old one at West Bridgford. Its address is Sovereign House, Queens-bridge Road, Nottingham. Tet

INTERNATIONAL CHALLENGE

BEDFORDSHIRE

A Division of a mejor British Compeny with expanding interests in professionals to complement their expansion plens.

Kay personnel ere now required et all levela of saniority to assist

ANALYST/PROGRAMMERS

Cendidates will have a minimum of one year's programming experience in either COBOL or ASSEMBLER gained in a commercial

30 Fleet Street, London EC4Y IAA

GREATER MANCHESTER

Our clients who ere one of the largest retail organisations in the UK are seeking exponenced staff for their naw hardwara to be announced shouly.

SENIOR PROGRAMMERS

SCALE RISING TO £5,200

You will have had two or three years' experience within a medium to large commercial installation using COBOL and proferably will have been educated to 'A' lovel standard. One of the programmers to be appointed

ANALYSTS

SCALE RISING TO £6,000

Our cliant seaks graduates with three to five years business systems and computer systems design experience for these challenging positions.

SYSTEMS PROGRAMMERS

SCALE RISING TO £5,700

Systems programmers with two years low lavel language experience in a commercial installation will have the opportunity of gaining large system

Company offers. Discount on goods, Pension Scheme, 17 days Holiday plus statutory re-location expanses will be considered



lan Bacon, Remini Computer Systems Ltd Roberts House, 80 Manchester Boad, Altinicham WA14 4191, office: 081 941-1922 horse- 101 940 (1985

THE

BETTER

This is whare you find tha

battar jobs . . . on this pega . . . et Gamini Ra-cruitmant.

You already know the

Gemini name as the larg-

ast soltwara group in

Now wa'ra tho nama to

coma to il you'ra looking lor outstanding job oppor-runitias at any laval.

If you don't saa a job that

Bacon. Ha'll gat thinga

moving for you.

ian Bacon

WA14 4PL.

061-941 1922

061-969 0965

Tel: Office

Systems Limited Roberts House

uits you hara, contact lan

GEMINI Recruitment

Run by Professionals
-for Professionals

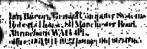
第一个人的

GEMINI Recruitment

SOFTWARE ENGINEERS— **MANCHESTER** TO £6000

The industrial systema division of Gemini is an acknowledged leader in the field of feel-time control applications utilizing Mini and Micro-Computer Systems, The division, as an Integral part of Cap-Gemini-Sogati, one of the world'e largest software organizations, is well placed to offer its wide renga of earvices to an ever-increasing expending market.

As demands for these services continue to increase they require more professional staff whit knowledge of process control, communications militery and diegnostic softwere, Familiarity white an Assembler language, Corel, RTL/2, Fortran or Besic woodlel usaful, experience of general computing applications is essential. In eddition to basic salary Gemini offers a substantial profit related In eddition to basic seasify German oners a substantial provides annuel bonus, free life heelth and socident insurance schemes, a minimum of four weeks annual holiday plus generous slowances while working on clients' eitas in the UK and Europe. Re-location assistance will be offered whete appropriate.



GEMINI Recruitment

MANCHESTER SALARIES £4100 - £7500

ANALYST PROORAMMERS. PL1 with real-time experience (software

SYSTEMS ANALYSTS. IBM Assombler preferably

ANALYST PROGRAMMER. Cobol/CICS.
PROGRAMMER OESIGNER. PL1 with Adabas or CICS.

PROGRAMMERS. 2 years' Cobol, ony machino. PROGRAMMERS. 1900. Cobol, Plan.

ANALYSTS. 1900, design experience.
COMPUTER OPERATORS. George III experience (three shift system).

LEEDS

SALARIES £4800 - £6500

SENIOR SYSTEMS OESIGNERS. Commercial Cobol, prelarably 16M. SYSTEMS OESIONERS. Commarcial applications Cobol. SYSTEMS PROGRAMMER. IBM Assamblor. PROGRAMMERS. 370 Cobol, CICS.
ANALYSTS PROGRAMMERS. Cobol / PL1 with CICS.

SHEFFIELD SALARIES £4000-£6500

ANALYST PROORAMMERS, PL1/Cobol with CICS. ANALYSTS. Engineering background with Cobol PROGRAMMERS. Univec Cobol. OATA BASE OESIONERS. Commercial data basa exporience. TRAINEE ANALYSTS. Good commercial Cobel background.

HULL SALARIES £4800 - £6000

PROJECT LEAGER. Accounting aystams axparianco. SYSTEMS OESION. Systems Analysts and Cobol experience. SENIOR PROGRAMMERS. 1900, 2-3 years' Cobol. PROORAMMERS, Two years' Cobol.
ANALYSTS, ICL Commorcial Systems background.

PRESTON **SALARIES £3700 - £5500**

SYSTEMS PROGRAMMER. George III Plan SYSTEMS ANALYSTS. Commercial 1900 hyphasilans najmainin PROGRAMMERS. 1900 Cobol.

OTHER LOCATIONS

NOTTINGHAM. PROJECT LEADER. Managor POP with transporta Ilon exparlance to £6500.

SRISTOL. OEC APPLICATIONS PROGRAMMER AND DEM

CHESHIRE. SYSTEMS PROGRAMMER, 370 Assembler Experience EOINSURGH, ISM Cobol or Assemblar PROGRAMMERS. £6000.

CURRENT CONTRACT REQUIREMENTS

PROGRAMMERS, ISM Cobol DOS or OS with CICS. Yorkshire PROGRAMMERS. Plan Cobol bus or US with CICS. Yorkshire.
PROGRAMMERS. Plan Cobol with Georga III. Manchestor.
PROGRAMMER. 3 years + Fortran. South Manchester.
PROGRAMMERS. Univac Cobol. Manchester.
PROGRAMMERS. Univac Cobol. Manchester.
PROGRAMMER/ANALYSTS. PL/1 and Mark IV with OL/1. Lancables.

cashira.
PROGRAMMER. Burroughs Cobol. Humberaide.
PROGRAMMERS, PL/1 with IMS. Menchasier/Midisode.
PROGRAMMER. POP1.1 Assemblar. Menchasier.
PROGRAMMER. POP1.1 Assemblar. Menchasier.
PROGRAMMERS. Coral 66 (single status). Numerous oversess.
PROGRAMMERS/ANALYSTS. PL/1 and Cobol with CICS. Geneva/



GEMINI Recruitment

PROJECT MANAGERS

Talmi E7 500 + plus new company car. Must be expenenced in design of municompanel based on line averems:

Ascii through the Logic Gate

An epic in 32K words, by Richard Forsyth Block 4 (His Head On The Chopping Block)

Hex and Clen have escaped from their captors and stambled upon o secret hidrag place high up in the Sierra Nueva. Meanwhile, back at Sprocket's Hole, there are signs of life.

DAVY Sprincket opened one bloodshot eye. The light hurt. He closed it ugain. His hend was throbbing. A hommer sermed in be punimelling from side to side repeatedly within his skull as if his hend had become a giant alarm clock that he couldn't switch off. He tried opening both his

"Oir God!" he grnoned, os the walls of the hut swam into

"Oli God!" he grnoned, os the walls of the hut swam into focus then blurred again. He stood up, every joint creaking undibly, and intered out through the open doorway. Once outside he bent double nnd vomited violently into the sand. This offorded him some slight relief. He was able to pull himself together sufficiently to inapect his internal errorlog file. It had overflowed ofter 4,096 entries but there was enough information left to paint a pretty dismal picture of the night before — one "seck fall: re-try" trace after another. His spindles had got completely out of alignment; and it showed. Not only that, apurious index records had proliferated so chaotically throughout his filestore that all the overflow buckets in his master directory were full; his entire memory organisotion was in imminent danger of entire memory organisation was in imminent danger of collapse. It seemen that a fault had developed in the virtual

address mnpping hardware. Only the root segment was unscathed. No wonder he couldn't think straight "Oh Gnd!" he moaned again, ond, enrrying his heod like an infinitely precious but frogile work of art, he stumbled back into the hut. After the glare outdoors the dimmer light inshio came as a relief, He was oble to make out Bootstrap's head.

budy, sprawled owkwardly under the toble.
Suddenly it oil came back to him. The guns. The
prisoners. They had gone. "What's going on here?" he
called nul. "Guddann it, Bnotstrap, get your back-end out
from under there!" He should his partner os hord as he
could, but Bootstrap remained oblivious to all sensory

Input. He had dropped out of reol time.

"Cleo!" hellowed Sprocket. There was no reply.

Then he remembered Kludge's appointment. Galvanised by fear, he spring to the whiteow. He could see no sign of unyone coming. According to the digital clock it was 0.1000E+02 precisely. That meant Kindge ond his team were already late by uver holf an hour, which was lucky for



him. He bent down and shook Bootstrap once more, without getting any response.

He was not fully awere that to be caught empty-handed by Kludge having lat their prisoners escape meant, easentlally, the scrap heap. There was nowhere lower to sink than this deserted outpost. He would simply be recycled. Even sweeping the punch room floor would be too good for him after a blunder like this. Desperately ha tried to think of some way out. His brows furrowed, in concentration.

"Got iti" His fist pounded the table.

If he could persuade them that Cleo and the Kld had been sprung by overwhelmingly auperior forces, there was a slim chance that they might get away with it. Buslly he began ransacking the room, overturning tha table, smashing the lega off chairs and hurling furniture through the window. He was almost enjoying himself. When he got to the leletype, standing useless in its corner, he pushed it over ond lengt up and down on it yelling, "You dumb terminali" in an attempt to deform its metal casing. But he scercely

So engrossed was he in this wholassie vandalism that, amidst the noise of breaking glass, he falled to notice the arrival of three interested spectators who stood just outside the door staring at his bizarre activities. At last he atood knee deep in wreekoge and could breathe a sigh of aatis-

"Now all we need to do is the ourselves up with some rope to make it look really convincing," he said, turning to look

"You can spare yourself the trouble," said one of the visitors, holding out a pair of handcuffs.

The state of the s

INSTITUTE OF OCEANOORAPHIC OCIENCER

SCIENTIFIC

OFFIGER/HIGHER

SCIENTIFIC OFFICER

NUMERICAL METHOOB

IN WAVE REBEARCH
The Institute of Oceanographic
Sciences is extending its existing
research into numerical medalling

research into numerical medelling at the dynamics of high waves mult is feating for sementer with leigh ability in numerical analysis to work on list project. Qualifications A good hencurs degree or equivolent qualification in Molliemetics of Computing with numerical enalysis, and on interest in opplication of numerical methods in litural mechanics is described. At local 2 years relevant operarross underschied and post praduate opposismes

relevant post graduate expaniance is required for Higher Belevatile

Salary and Conditions
Appointment will be meda as a Scientific Officer (S.O.) or Higher Scientific Officer (S.O.), depending on qualifications and experience, on the following selary scales
S.O. £283B.p.a. £441B.p.a.
Starting pay may be shove the minimum.

minimum.
Staff of the Council are not Civil.
Sorvents, but their pay and conditions are similar to those of the

Incre is 8 non-contributory per-sion scheme and generous/esve allowence. Application forms and jurities

iculars aro oblainable from

Wormley Godelming Surrey GUB 5UB

593. Closing date for applications 10 July 1878

(Tolephone Wormley (0429 79) quoting (clerance no 78/0) 1// 593

NATURAL ENVIRONMENT RESEARCH COUNCIL

SHILLTER the National Companyon Horselets months a bright.

CAPABLE PERSON

to supervise & group of Valuntee etigaged in maintaining their register supportant Scinco clarical work as hason with computer bureau.

Please apply to Recivil Bainingst 01-833 9377, or while to Shoke. I Vistarioe Road SEI 8000

Seary 13095 13748

The Secretary
The Institute of Oceono

Officer
Salary and Conditions

Sprocket gaaped. He found himself face to face with Inspector Extracode. Behind Extracode was the redoubtable Commander Kludge, flanked by yet o third inportant lnoking robot.

Extracode stepped forward and slipped the handcuffs

eriaply over his wrists.
"I can explain..." began a deflated Sprocket.
"Save your explanations for the triel," interrupted Kludge, "Just tell us one thing: where ere Hex and the girl?"

"Well," began Sprockal again, but he never finished the sentence. Worn out by his manic exertions, his memory befuddled by Cleo's random quadratic rehashing, and with no possibility of connection to the Network for a storage regeneration, he finally auccumbed to the onslaught of sementic overload. His eyes glazed over,

"Abnormal job termination," he said in a flat voice.
"Processor queue is being reloaded. Please re-submit

input."
"Switch him off," ordered Kludge curtly. "He can be of no further use to us. We'll learn nothing here. Our journay has been wasted. We shall return to the Computer Centre "What about the one under the table?" asked Extracode.

"If we can revive him he may tell us somathing."

"Let them both rot," replied Kludge, ond atrode Imperiously from the room, his two assistants in train.

is this the post mortem dump for Sheriff Sprocket and his deputy? Sa prepared for a change of soons in our next issue. 4 1978, Richard Forsyth, RAIR Thursharing.

OPPORTUNITIES IN DATA PROCESSING FOR PROGRAMMERS, ANALYSTS AND OPERATORS AT OUR **LEEDS AND LIVINGSTONE** PLANT

Salaries: £4,000 to £6,000 depending on experience and qualifications

We are a mejor international anginearing company, and our product mix includes super-alloy forging, oil-drilling aculpment, end a rongo of ball valves for the earospace, petrochamical and ges/oil industries.

We offer progressive Octa Processing facilities and attitudes involving a comprohensive Batch RJE and VOU natwork running under DOS-VS/POWER-VS/CICS-VS

Our computer projects backlog is varied and substantial, featuring continued development of on-line systems for manufacturing, plenning and control.

Oue to the importance of these developments, we are expending our systems and programming teem and are seeking Programmers, Operators and Analysis at various levels. The positions will appeal to competent individuals who will which will be well defined but which will be tabled under minimum supervision. Experience with CICS, VSAM, OLI. COBOL, or IBM BAL would be en advantage, but training will be

We have a contributory life assurance and penaron plan and good cantaan facilities, and assistance with re-location axpenses where appropriate

Written applications from males or lemales should be for warded to

The Personnel Manage Cameron Iron Works Ltd. Queen Street, Stourton Leeds 1510 188 Tel: Leads 701144

CONSULTING & SOFTWARE HOUSE MICHAEL LUCLAM & ASSOCIATES HIT TO THE LUNDON ; KOLLAND : LEEDS ; MIDLANDS

MIDIAND POP II Basic + Programments, \$5,000 + plus new c

POLYMOGRADE CHESTERFIELD THEPPORE DZ46 89298 anyuma

Opportunities in a marketing company

Bell & Howell — based in Alperton — market a diverse range of sophisticated audio visual, video aquipment and consumer technical products.

That's why wa're currently strangthening our computer function which is based eround an IBM 3/158 using RPG 2. And why wa're now looking for the following

Senior Programmer c£5000 p.a.

planning/writing/testing naw programmes; for con-irolling work to meet terget dates; for ensuring that

Responsible to the Oate Processing Manager for necessary documentation is maintained; for amanding operational programmes and instructions.

Programmer c£3500 p.a.

To write, check, modify end test existing programmas: to prepare operation instructions/job manual/

The fringe benefit package and conditions of employment are those you would expect from a successful

BELLE HOWELL AUDIO-VISUAL & CONSUMER DIVISION

associated documentation and to maintain pra-set installation standards. .

company — including ganardus aick pay/pansion schama, four weaks' holiday end subsidiaed meals. For more information or an application form plaase



contact Personnel Services Manager Bell & Howell Limited Alperton House Bridgewater Road Wembley Middlesex HAO 1EG Tel: 902 8812



A Systems 3 Analyst / Programmer who a career step to mans dement, is required to locking for that rest career step to management, is t also charge of an installation in South West London. The Company currently running an IBM System 3, model 9 is System 34 is envisaged as pert of the development of the

Applicants should have o good background in OCL, RPG I Anglysis, and an organisational fibrity.

Phone: 91-352 8201 or write to: X-Cellbur 47 Essex Street, London WO28 3JF



FREELANCERS

CENTRAL SYSTEMS CONSULTING